EPA/ROD/R03-88/051
1988

EPA Superfund
Record of Decision:

SOUTHERN MARYLAND WOOD TREATING
EPA ID: MDD980704852
OU 01
HOLLYWOOD, MD
06/29/1988

Text:

#DE
DECLARATION

THE SELECTED REMEDY IS PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT, ATTAINS FEDERAL AND STATE REQUIREMENTS THAT ARE APPLICABLE OR RELEVANT AND APPROPRIATE, AND IS COST EFFECTIVE. THE REMEDY SATISFIES THE PREFERENCE FOR TREATMENT THAT REDUCES TOXICITY, MOBILITY, OR VOLUME AS A PRINCIPAL ELEMENT. FINALLY, IT IS DETERMINED THAT THIS REMEDY UTILIZES PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE. SINCE THIS REMEDY WILL NOT RESULT IN HAZARDOUS SUBSTANCES REMAINING ONSITE ABOVE HEALTH BASED LEVELS, THE FIVE YEAR FACILITY REVIEW WOULD NOT APPLY TO THIS ACTION.

DATE
06/29/88

JAMES M. SEIF
REGIONAL ADMINISTRATOR
REGION III

#SNLD
I. SITE NAME, LOCATION, AND DESCRIPTION

THE SOUTHERN MARYLAND WOOD TREATING (SMWT) SITE IS LOCATED OFF ROUTE 235 IN HOLLYWOOD, ST. MARY'S COUNTY, MARYLAND. A REGIONAL LOCATION MAP IS SHOWN IN FIGURE 1. THE SITE COMPRISES APPROXIMATELY 25 ACRES IN THE NORTHWEST PORTION OF A 96-ACRE PROPERTY. ABOUT FOUR ACRES WERE PREVIOUSLY DEVOTED TO A WOOD TREATMENT OPERATION. THE SITE IS SURROUNDED BY RESIDENTIAL AND AGRICULTURAL AREAS.

THE SMWT SITE IS LOCATED WITHIN THE ATLANTIC COASTAL PLAIN PHYSIOGRAPHIC PROVINCE. TOPOGRAPHIC RELIEF ACROSS THE SITE IS ABOUT 35 FEET, WITH ELEVATION RANGING BETWEEN APPROXIMATELY 119 TO 154 FEET ABOVE SEA LEVEL. THE SMWT SITE LIES ON A DRAINAGE DIVIDE SUCH THAT RUNOFF FROM THE SITE DISCHARGES TO TRIBUTARIES THAT STRADDLE THE SITE TO THE EAST AND WEST. BOTH OF THESE TRIBUTARIES DISCHARGE TO THE POTOMAC RIVER VIA BROOKS RUN AND MCINTOSH RUN. REGIONALLY, THE SITE IS LOCATED CLOSE TO THE DRAINAGE DIVIDE BETWEEN THE POTOMAC AND PATUXENT RIVER BASINS.

#SH

II. SITE HISTORY

THE SMWT FACILITY WAS OWNED AND OPERATED BY SOUTHERN MARYLAND WOOD TREATING CO. FROM 1965 TO 1978 AS A PRESSURE TREATMENT FACILITY FOR WOOD PRESERVATION. A SITE SKETCH, INDICATING THE LOCATIONS OF VARIOUS FEATURES, STRUCTURES, AND SURFACE WATER BODIES ON THE SITE, AS WELL AS THE PROPERTY BOUNDARY, IS SHOWN IN FIGURE 2.

AVAILABLE INFORMATION INDICATES THAT CREOSOTE AND PENTACHLOROPHENOL (PCP) WERE USED AS WOOD PRESERVATIVES AT THE FACILITY. WOOD TREATMENT ACTIVITIES ARE NO LONGER BEING PERFORMED AT THE SITE. PRESENTLY, HOWEVER, A PORTION OF THE SITE IS LEASED TO RIDGE MARINE SALES FOR USE AS A RETAIL OUTLET FOR PRETREATED LUMBER AND CRAB TRAPS.

THE WASTES GENERATED AT THE SWMT SITE INCLUDED RETORT AND CYLINDER SLUDGES, PROCESS WASTES, AND MATERIAL SPILLAGE. HERE WASTES WERE DISPOSED OF IN SIX UNLINED LAGOONS ON-SITE. AN ON-SITE FRESHWATER POND BECAME CONTAMINATED WITH VOLATILE ORGANIC COMPOUNDS (VOC'S), POLYNUCLEAR AROMATICS (PNA'S), AND OTHER BASE NEUTRAL EXTRACTABLES (BNAS) DURING THE FACILITY'S ACTIVE AND SUBSEQUENT INACTIVE PERIODS FROM CONTAMINATED GROUNDWATER AND SURFACE RUNOFF.

PURSUANT TO LEGAL ACTIONS TAKEN BY THE MARYLAND DEPARTMENT OF HEALTH AND MENTAL HYGIENE THE POTENTIALLY RESPONSIBLE PARTY (PRP), L.A. CLARKE AND SONS, INC., INITIATED CLEAN-UP ACTIONS AT THE SITE IN 1982. LIQUIDS FROM THE LAGOONS WERE SPRAY IRRIGATED ONTO THE NEARBY WOODS.

THE SIX WASTE LAGOONS WERE EXCAVATED AND THE AREA WAS BACKFILLED AND GRADED. THE FRESHWATER POND WAS PARTIALLY EXCAVATED. EXCAVATED SLUDGES WERE MIXED WITH COMPOSTED SLUDGE, TOPSOIL, AND GRASS SEED, THEN SPREAD IN A LEVEL TREATMENT AREA ON THE PROPERTY.

SYNOPSIS OF PREVIOUS INVESTIGATIONS

AUGUST 1982 - FIELD INVESTIGATION CONDUCTED BY EPA REGION III. INCLUDED SAMPLING OF DOMESTIC WELLS, MONITORING WELLS, SURFACE WATERS, SOILS, AND SEDIMENTS.

OCTOBER 1984 - SITE ASSESSMENT PERFORMED BY EPA TECHNICAL ASSISTANCE TEAM. SAMPLING RESULTS, HOWEVER, COULD NOT BE VALIDATED.

DECEMBER 1984 - DOMESTIC WELL SAMPLING REVEALED NO CONTAMINATION IN OFF
- SITE DOMESTIC WELLS.

JANUARY 1985 - SITE ASSESSMENT SAMPLING. TANK, SOIL CORE, SEDIMENT, SURFACE WATER AND MONITOR WELL SAMPLES WERE COLLECTED FOR ANALYSES. SAMPLING CONFIRMED CONTAMINATION FROM PNA AND PCP IN SURFACE WATER AND SEDIMENTS OF THE FRESHWATER POND AND WEST TRIBUTARY, ON-SITE SOILS, AND AN ON-SITE MONITORING WELL. TANK SLUDGE SAMPLES WERE CONTAMINATED WITH CHLORINATED DIBENZODIOXINS.

PREVIOUS REMOVAL ACTIONS

MARCH 1985 - A REMEDIAL REMOVAL ACTION WAS BEGUN WITH 350 SAMPLES OBTAINED AND ANALYZED AT THE SITE. DATA INDICATED A WIDESPREAD DISTRIBUTION OF CONTAMINANTS THROUGHOUT THE SITE. HIGHER CONTAMINANT CONCENTRATIONS WERE DETECTED IN SAMPLES FROM THE PROCESS AREA, FORMER LAGOON AREA, LAND TREATMENT AND SPRAY IRRIGATION AREAS.

APRIL 1985 - STRAW FILTER FENCES WERE INSTALLED TO CONTROL DOWNSTREAM MIGRATION OF SEDIMENTS ALONG THE WEST TRIBUTARY.

JANUARY 1986- APPROXIMATELY 1400 Y/D3 OF SOIL WERE EXCAVATED FROM THE NORTHWESTERN BANK OF THE FRESHWATER POND AND STORED ON-SITE. THE EXCAVATED SOILS WERE PLACED ONTO A SYNTHETIC LINER TO THE EAST OF THE FORMER LAGOON AREA AND CAPPED WITH A SYNTHETIC COVER.

#SC
SITE CHARACTERIZATION

THE REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RI/FS) FOR THE SMWT SITE WAS PERFORMED IN A PHASED MANNER. THE RESULTS OF EACH PHASE WERE USED TO FOCUS DATA REQUIREMENTS OF SUCCESSIVE PHASES AND PROVIDE SUPPORT TO THE REMEDIAL ALTERNATIVE ANALYSIS. THE OBJECTIVES OF AND SCOPE OF THE THREE RI PHASES FOR THIS SITE ARE SHOWN IN TABLES 1, 2, AND 3.

THE RESULTS OF SAMPLING AND ANALYSIS FOR THE RI PHASES ARE SUMMARIZED BELOW:

I. GROUNDWATER QUALITY

A) RESIDENTIAL WELL WATER QUALITY

NO CONTAMINANTS OF CONCERN WERE DETECTED IN ANY RESIDENTIAL WELL SAMPLES OFF-SITE FROM THE SMWT FACILITY.

B) ON-SITE GROUNDWATER QUALITY

ON-SITE SHALLOW GROUNDWATER CONTAMINATION APPEARS TO BE LOCALIZED IN AN AREA ROUGHLY BOUNDED BY MONITOR WELLS MW-08, MW-12, AND MW-05, AS

SHOWN IN FIGURE 3. THE SHALLOW GROUNDWATER FLOW IN THE CONTAMINATED AREA IS DIRECTED TOWARDS THE ON-SITE POND. THE POND, THEREFORE, REPRESENTS A LOCAL DISCHARGE POINT FOR SHALLOW GROUNDWATER AND ASSOCIATED CONTAMINANTS. SEEPS OF BLACK HYDROCARBON-LIKE LIQUID HAVE BEEN OBSERVED ALONG THE EASTERN EDGE OF THE ON-SITE POND.

ANALYTICAL RESULTS FROM THE DEEP MONITOR WELL SAMPLES SUGGEST THAT THERE IS NO CONTAMINATION OF THE DEEPER WATER-BEARING STRATA DIRECTLY UNDERLYING THE SITE. A CLAY AND SILT LAYER SEPARATES THE SHALLOW GROUNDWATER IN THE UPLAND DEPOSITS AND THE DEEPER WATER BEARING ZONE. THE CLAY AND SILT LAYER HAS RESTRICTED THE DOWNWARD MIGRATION OF GROUNDWATER CONTAMINANTS FROM THE SHALLOW ZONES TO DEEPER ZONES.

OVERALL, THE PHASE II AND PHASE III ANALYTICAL RESULTS INDICATE THAT THE GROUNDWATER CONTAMINATION AT THE SITE IS CONFINED TO THE SATURATED DEPOSITS ABOVE THE CLAY AND SILT LAYER IN A RELATIVELY LIMITED AREA AS SHOWN IN FIGURE 3.

THE SHALLOW-GROUNDWATER IN THE CONTAMINATED AREA CONTAINS VOLATILE AND SEMI-VOLATILE CONTAMINANTS IN THE TENS-TO-HUNDREDS OF PARTS PER MILLION RANGE (TABLE 4). THE MOST COMMONLY OCCURRING VOLATILE ORGANICS, BASE NEUTRAL/ACID EXTRACTABLE AND PNA COMPOUNDS FOUND IN THE WATER SAMPLES ARE LISTED IN TABLE 5. MANY OF THESE COMPOUNDS ARE AT LEAST PARTIALLY WATER SOLUBLE AND WOULD BE EXPECTED TO MIGRATE IN THE SHALLOW GROUNDWATER.

THE CONCENTRATIONS OF ACENAPTHENE, FLUORENE, AND PHENANTHENE IN GROUND-WATER SAMPLES WERE IN EXCESS OF THE REPORTED SOLUBILITIES OF THESE COMPOUNDS IN WATER. FURTHERMORE, A DENSE, NON-AQUEOUS PHASE LIQUID WAS FOUND AT THE INTERFACE OF THE SHALLOW AQUIFER AND CLAY LAYER IN WELLS MW-08 AND MW-11.

GROUNDWATER SAMPLES FROM SELECTED SHALLOW-MONITORING WELLS WERE ALSO ANALYZED FOR CHLORINATED-DIBENZODIOXINS AND DIBENZOFURANS. THE 2,3,7,8-TETRACHLORO-DIBENZODIOXIN (TCDD) TOXICITY EQUIVALENT FACTORS (TEF) REPORTED FOR THE GROUNDWATER SAMPLES WERE BELOW 0.01 UG/L AND ARE THEREFORE BELOW THE ACTION LEVEL.

II AMBIENT AIR QUALITY

BOTH REAL-TIME AND TIME-WEIGHTED AIR MONITORING SAMPLES TAKEN BOTH ON-SITE AND AROUND THE SITE PERIMETER, SHOWED NO CONTAMINANTS OF CONCERN IN CONCENTRATIONS THAT WOULD NEED TO BE ADDRESSED IN A REMEDIAL ACTION AT THE SITE.

III SOILS

A) SURFACE SOILS

ANALYTICAL RESULTS FOR SURFACE SOIL SAMPLES (0-2 FOOT DEPTH INTERVAL) ARE SUMMARIZED BY AREAS IN TABLE 6. (THE AREAS DESCRIBED ARE SHOWN IN FIGURE 4). THE MOST FREQUENTLY IDENTIFIED ORGANIC COMPOUNDS ARE LISTED IN TABLE 7; DIOXIN/FURAN RESULTS ARE SHOWN IN TABLE 8.

HAZARDOUS SUBSTANCES LIST (HSL) ORGANIC CONTAMINATION IN THE SURFACE SOILS IS WIDESPREAD AND DOES NOT FOLLOW ANY SPECIFIC PATTERN. THE ANALYTICAL RESULTS ARE CONSISTENT WITH THE OPERATING HISTORY AND REMEDIAL ACTIVITIES THAT HAVE OCCURRED AT THE SITE.

SURFACE SOILS IN THE LAND TREATMENT AREA ARE THE MOST CONTAMINATED SURFACE SOILS AT THE SMWT SITE, CONSISTENT WITH THE LAND FARMING OF LAGOON SLUDGES IN THIS AREA. THE MAXIMUM TOTAL PNA CONCENTRATIONS IN THE LAND TREATMENT AREA WAS 4,120,000 UG/KG PPB).

SURFACE SOILS IN THE EXCAVATED LAGOONS AREA ALSO CONTAIN ELEVATED CONCENTRATIONS OF PNA'S. THE NORTHERN PART OF THE SITE, INCLUDING THE NORTHEAST TANK AREA AND THE UPPER SITE AREA, SHOWED WIDELY VARIABLE

CONTAMINANT CONCENTRATIONS. THESE RESULTS ARE CONSISTENT WITH THE USE OF THIS AREA TO STORE FINISHED PRODUCTS.

THE SURFACE SOIL SAMPLES FROM THE VICINITY OF THE FRESHWATER POND CONTAINED NO DETECTABLE OR LOW PART-PER-MILLION LEVELS OF CONTAMINANTS. SOILS IN THE PROCESS AREA CONTAINED UP TO 1290 UG/KG OF PNAS; NO ORGANIC CONTAMINANTS WERE DETECTED IN SURFACE SOIL SAMPLES FROM THE SPRAY IRRIGATION AREA.

THE DIOXIN CONGENERS FOUND IN SURFACE SOIL SAMPLES WERE THE MORE HIGHLY CHLORINATED, RELATIVELY LESS TOXIC FORMS. ALTHOUGH HEPTA-ANDOCTA-CHLORINATED DIBENZODIOXINS WERE DETECTED IN ALL SURFACE SOIL SAMPLES, AND HEXA-CHLORINATED DIBENZODIOXIMS WERE FOUND IN SEVEN OF 13 SURFACE SOIL SAMPLES, ALL OF THE COMPOUNDS EXIST AT LEVELS WELL BELOW EPA'S ESTABLISHED ACTION LEVEL FOR THESE COMPOUNDS. NO TETRACHLORINATED DIBENZODIOXIN WERE DETECTED IN THE SURFACE SOIL SAMPLES.

B) SUBSURFACE SOILS

SUBSURFACE SOILS ARE DEFINED AS THOSE ENCOUNTERED BELOW A DEPTH OF TWO FEET. THE ANALYTICAL RESULTS FOR SUBSURFACE SOILS AREA SUMMARIZED BY AREA IN TABLE 9. THE MOST FREQUENTLY IDENTIFIED ORGANIC COMPOUNDS ARE LISTED IN TABLE 10.

EXCEPT IN THOSE AREAS WITH A LONG HISTORY OF WASTE DISPOSAL, THE ORGANIC CONTAMINANTS ARE CONFINED TO THE UPPER 10 FEET OF SOIL. IN THE PROCESS AND EXCAVATED LAGOON AREAS, THE CONTAMINANTS WERE ENCOUNTERED DOWN TO THE CLAY AND SILT LAYER. THE ORGANIC COMPOUNDS MOST COMMONLY IDENTIFIED IN THE SUBSURFACE SOILS INCLUDE MORE MOBILE PNA'S (NAPTHALENE, 2-METHYL-NAPTHALENE) AND ACID EXTRACTABLES (PHENOL, 2-METHYLPHENOL, 2,4-DIMETHYLPHENOL). THESE PARAMETERS ARE ALSO FOUND IN GROUNDWATER SAMPLES, BUT NOT COMMONLY FOUND IN SURFACE SOIL SAMPLES.

SOIL SAMPLES COLLECTED FROM THE PHASE III SOIL BORINGS WERE ANALYZED FOR CHLORINATED DIBENZO-DIOXINS/FURANS. LIKE THE BACKGROUND SOILS, THE HEPTA-ANDOCTA-CHLORINATED DIBENZO-DIOXIN/FURANS (THE RELATIVELY LESS TOXIC FORMS) REPRESENT THE HIGHEST PERCENTAGE OF COGENERS FOUND IN THE SUBSURFACE SAMPLES.

IV TANKS AND RETORTS

EXCLUDING A PROPANE STORAGE TANK AND THE BOILER TREATMENT WATER MAKE-UP TANK, 14 TANKS AND TWO RETORTS WERE FOUND ON SITE. THE LOCATIONS OF THESE TANKS AND RETORTS ARE DEPICTED IN FIGURE 5. TABLE 11 SUMMARIZES THE ANALYTICAL RESULTS FOR THE TANK SAMPLES.

A TOTAL OF APPROXIMATELY 11,960 GALLONS OF NON-TCDD DIOXIN CONTAMINATED WASTES ARE PRESENT IN TANKS 3,4,5,9,10, AND 12. DUE TO THE SIMILARITY OF APPEARANCE TO THE MATERIAL IN TANKS 9 AND 12, THE WASTE IN TANK 10 IS ALSO ASSUMED TO CONTAIN DIOXINS.

ADDITIONALLY, A TOTAL OF APPROXIMATELY 2,140 GALLONS OF TANK WASTES DO NOT CONTAIN DIOXINS OF THESE 2,140 GALLONS, ALL CONTAIN TOTAL VOLATILE ORGANIC COMPOUNDS CONCENTRATIONS GREATER THAN 300 PPB, AND 2,100 GALLONS CONTAIN TOTAL PNA CONCENTRATIONS OF 191,000 PPB.

V SURFACE WATER AND SEDIMENTS

THE ANALYTICAL RESULTS FOR SURFACE WATER AND SEDIMENT SAMPLES ARE SUMMARIZED IN TABLE 12.

IN THE SEDIMENT SAMPLES COLLECTED ALONG THE WEST TRIBUTARY, TOTAL PNA CONCENTRATIONS IN THE TENS OF PARTS PER MILLION WERE ENCOUNTERED UP TO 1,900 FEET DOWNSTREAM OF THE FRESHWATER POND, AT THE CONFLUENCE OF THE EAST AND WEST TRIBUTARIES. SURFACE WATER CONCENTRATIONS OF ORGANIC CONTAMINANTS ARE IN THE TENS TO HUNDREDS OF PARTS PER BILLION ALONG THIS

SECTION OF STREAM.

ALONG THE EAST TRIBUTARY, CONTAMINANT CONCENTRATIONS IN SEDIMENTS RANGED FROM NONDETECTABLE TO APPROXIMATELY TWO PARTS PER MILLION. SURFACE WATER CONTAMINANTS RANGE FROM NONDETECTABLE TO PARTS PER BILLION.

AT DISTANCES BETWEEN 4,450 AND 7,125 FEET FROM (BELOW THE CONFLUENCE OF EAST AND WEST TRIBUTARIES) FROM THE FRESHWATER POND, SEDIMENT CONTAMINATION RANGES FROM NONDETECTABLE TO 41 UG/KG OF PNAS, WHILE SURFACE WATER CONTAMINATION WAS NOT DETECTED. TABLE 13 PROVIDES A SUMMARY OF THE MOST FREQUENTLY IDENTIFIED ORGANIC CONTAMINANTS IN SURFACE WATER AND SEDIMENTS. THE CONTAMINANTS DETECTED IN THE SURFACE WATER SAMPLES ARE SIMILAR TO THOSE COMPOUNDS FOUND IN GROUNDWATER. SEDIMENT RESULTS ARE SIMILAR TO RESULTS OBTAINED FOR THE SURFACE SOILS. THIS DATA SUPPORTS TWO PATHWAYS OF CONTAMINANT MIGRATION AT THE SITE. THE TRANSPORT OF CONTAMINANTS FROM SURFACE SOILS TO STREAM SEDIMENTS THROUGH SURFACE RUNOFF/EROSION IS INDICATED BY THE DATA AND THE LOW COHESIVE STRENGTH OF THE SITE SOILS. ADDITIONALLY, THE DIRECT DISCHARGE OF CONTAMINATED GROUNDWATER INTO THE FRESHWATER POND IS SUPPORTED BY THE SIMILAR CONTAMINANTS IN BOTH MEDIA AND VISUAL OBSERVATION OF SEEPS ALONG THE POND BANK, AND THE PRESENCE OF CONTAMINANTS IN SURFACE WATER AND SEDIMENTS.

RESULTS OF 0-TO 6 INCH AND 6- TO 12- INCH SEDIMENT SAMPLES ANALYZED BY A UV SCREENING METHOD WERE COMPARED. THIS COMPARISON INDICATES THAT SAMPLES FROM THE 0-TO 6- INCH AND 6- TO 12- INCH SAMPLE INTERVALS TYPICALLY CONTAIN PNA CONCENTRATIONS WITHIN THE SAME ORDER OF MAGNITUDE. THIS IS CONSISTENT WITH THE LONG-TERM DEPOSITION OF SEDIMENTS CARRYING CONTAMINANTS FROM UPSTREAM SOURCES AND DOES NOT INDICATE SIGNIFICANT CHANGES IN CONTAMINANT CONCENTRATION OVER TIME.

ALTHOUGH DIOXINS AND FURANS WERE DETECTED IN SURFACE WATERS AND SEDIMENTS, TOXICITY EQUIVALENT FACTORS WERE AT OR BELOW 0.010 PPB. NO TETRA-ORPENTA-CHLORINATED DIBENZODIOXINS WERE DETECTED IN SURFACE WATER OR SEDIMENT SAMPLES.

#CHR
COMMUNITY RELATION HISTORY

THERE HAS BEEN COMMUNITY INTEREST IN THE SOUTHERN MARYLAND WOOD TREATING SITE SINCE BEFORE THE WOOD TREATING FACILITY WAS BUILT IN 1965. SEVERAL INDIVIDUALS REPORTED THAT NEARBY RESIDENTS INFORMALLY PROTESTED THE CONSTRUCTION OF AN INDUSTRIAL FACILITY ON THE PROPERTY, AS THE RESIDENTS HOPED THE LAND WOULD BE USED FOR RESIDENTIAL DEVELOPMENT.

AFTER THE SOUTHERN MARYLAND WOOD TREATING PLANT WAS BUILT AND OPERATIONS BEGAN, RESIDENTS LIVING NEARBY COMPLAINED TO COUNTY HEALTH OFFICIALS OF STRONG CREOSOTE-LIKE ODORS COMING FROM THE SITE. AS A FOLLOW-UP TO THESE COMPLAINTS, THE ST. MARY'S COUNTY HEALTH DEPARTMENT SAMPLED AIR QUALITY AROUND THE SITE, BUT THE RESULTS OF TESTS WERE INCONCLUSIVE.

LOCAL OFFICIALS AND RESIDENTS HAVE EXPRESSED CONTINUING INTEREST IN EPA'S PROGRESS AT THE SITE. BOTH HAVE INDICATED THAT THEY WANT AN EFFECTIVE, PERMANENT REMEDY AND THAT THEY WISH TO BE KEPT APPRAISED OF NEW DEVELOPMENTS.

LOCAL OFFICIALS REPORT THAT NO FORMAL COMMUNITY GROUPS HAVE FORMED IN RESPONSE TO THE CLASSIFICATION OF THE SOUTHERN MARYLAND WOOD TREATING SITE AS A HAZARDOUS WASTE SITE. HOWEVER, OTHER ESTABLISHED COMMUNITY ORGANIZATIONS, SUCH AS THE POTOMAC RIVER ASSOCIATION AND THE PATUXENT RIVER ASSOCIATION, MAINTAIN AN INTEREST IN SITE FINDINGS AND DEVELOPMENTS. BOTH GROUPS ARE CONCERNED WITH THE PRESERVATION OF THE POTOMAC AND PATUXENT RIVERS AND KEEP A WATCHFUL EYE OVER CONDITIONS AND ACTIVITIES THAT THREATEN THE AREA'S AQUATIC ENVIRONMENT.

IN ADDITION, A CLASS OF SCIENCE STUDENTS ATTENDING CHOPTICON HIGH

SCHOOL IN ST. MARY'S COUNTY HAS TAKEN AN INTEREST IN THE SITE. SINCE SEPTEMBER 1985, THE CLASS HAS STUDIED THE CHESAPEAKE BAY AND CLEANUP INITIATIVES CURRENTLY BEING UNDERTAKEN TO PRESERVE THE BAY'S ENVIRONMENT. THE TEACHER OF THE CLASS BELIEVED IT WAS IMPORTANT FOR STUDENTS TO GET A BETTER SENSE OF CURRENT EVENTS IN THEIR COMMUNITY AND HOW THOSE EVENTS IMPACT THE ECOSYSTEM OF THE BAY. HE THEREFORE ENCOURAGED STUDENTS TO FOLLOW MEDIA COVERAGE OF THE SOUTHERN MARYLAND WOOD TREATING SITE AND RESEARCH THE CONTAMINATION PROBLEMS REPORTED IN SITE FINDINGS. AS PART OF THAT RESEARCH, A GROUP OF STUDENTS ATTENDED THE NOVEMBER PUBLIC MEETING CONDUCTED BY EPA OFFICIALS AND ASKED A NUMBER OF QUESTIONS ABOUT THE EXTENT AND EFFECTS OF CONTAMINATION FOUND AT THE SITE AND THE COST OF CLEANUP ACTIVITIES.

MEDIA COVERAGE OF THE SOUTHERN MARYLAND WOOD TREATING SITE HAS BEEN EXTENSIVE IN THE LOCAL PRESS. RECENT COVERAGE HAS INCLUDED STORIES ON PUBLIC MEETINGS CONDUCTED BY EPA OFFICIALS AND THE COMPLETION OF REMOVAL ACTIVITIES AT THE SITE. COUNTY OFFICIALS REPORT THAT , IN GENERAL, THE LOCAL PRESS IS AN IMPORTANT COMMUNICATIONS VEHICLE IN ST. MARY'S COUNTY.

#RAO
REMEDIAL ACTION OBJECTIVE

UTILIZING DATA GENERATED DURING THE RI, A PUBLIC HEALTH EVALUATION (PHE) WAS CONDUCTED TO EVALUATE THE POTENTIAL IMPACTS ON PUBLIC HEALTH AND THE ENVIRONMENT THAT MAY RESULT FROM THE RELEASE OF HAZARDOUS SUBSTANCES FROM THE SOUTHERN MARYLAND WOOD TREATING SITE. A BASELINE ASSESSMENT WAS CONDUCTED EVALUATING THE SITE IN THE ABSENCE OF REMEDIATION AND THEN COMPARED WITH VARIOUS POTENTIAL REMEDIAL ALTERNATIVES FOR THIS SITE.

FOR CURRENT USE SCENARIOS INVOLVING THE EXPOSURE OF TRESPASSERS TO CONTAMINATED SOIL AND SEDIMENT, THE NONCARCINOGENIC CHEMICALS IN THE SOIL OR SEDIMENTS ARE NOT EXPECTED TO POSE A THREAT TO HUMAN HEALTH BECAUSE THE HAZARD INDICES FOR THESE EXPOSURES ARE LESS THAN ONE. THE RISKS ASSOCIATED WITH EXPOSURE TO THE CARCINOGENIC CHEMICALS UNDER THESE SCENARIOS, HOWEVER, EXCEED 10-6 UNDER THE PLAUSIBLE MAXIMUM CASE.

FOR FUTURE USE SCENARIOS INVOLVING THE EXPOSURE OF CONSTRUCTION WORKERS TO CONTAMINATED SOIL, THE PRESENCE OF THE NONCARCINOGENIC CHEMICALS IS NOT LIKELY TO POSE A THREAT TO HUMAN HEALTH BECAUSE THE HAZARD INDICES FOR BOTH THE MAXIMUM CASE AND THE AVERAGE CASE SCENARIOS WERE LESS THAN ONE. THE EXCESS RISK OF LIFETIME CANCER ASSOCIATED WITH EXPOSURE TO THE CARCINOGENIC CHEMICALS UNDER THIS SCENARIO, HOWEVER, EXCEED 10-6 UNDER THE PLAUSIBLE MAXIMUM CASE.

FOR FUTURE EXPOSURE SCENARIOS INVOLVING THE EXPOSURE OF RESIDENTS TO CONTAMINATED SURFACE SOILS, THE NONCARCINOGENIC CHEMICALS IN THE SOIL ARE NOT EXPECTED TO POSE A THREAT TO HUMAN HEALTH UNDER THE MAXIMUM OR AVERAGE EXPOSURE CONDITIONS.

THE RISK ASSOCIATED WITH EXPOSURE TO THE CARCINOGENIC CHEMICALS FOR A LIFETIME RESIDENT UNDER THIS SCENARIO, HOWEVER, EXCEEDS 10-6 UNDER BOTH THE AVERAGE AND THE PLAUSIBLE MAXIMUM CASE. THIS SUGGESTS THAT EXPOSURES TO THE CARCINOGENIC PNAS MAY POSE SOME THREAT TO HUMAN HEALTH UNDER THE CONDITIONS OF THESE ASSUMPTIONS FOR A POTENTIAL RESIDENT RESIDING AT THE SOUTHERN MARYLAND SITE FOR A LIFETIME.

REMEDIAL ACTION OBJECTIVES ARE LONG-TERM, PERMANENT REMEDIES THAT ELIMINATE UNACCEPTABLE RISK TO HUMAN HEALTH AND THE ENVIRONMENT. THIS IS ACCOMPLISHED TO THE MAXIMUM EXTENT PRACTICABLE THROUGH TREATMENT AND/OR DESTRUCTION OF CONTAMINANTS AT THE SITE.

THE OBJECTIVES OF THE PROPOSED REMEDIAL ACTIONS ARE TO:

* REDUCE OR ELIMINATE ORGANIC CONTAMINATION IN SITE SUR
  -FACE SOILS TO CLEANUP LEVELS ESTABLISHED FOR CONTACT AND
  INCIDENTAL INGESTION OF CARCINOGENIC POLYNUCLEAR AROMATIC

HYDROCARBONS (PNAS) BY FUTURE RESIDENTS (2.2 PPM CPNAS BASED ON A MAXIMUM 1 X 10-6 LIFETIME CANCER RISK).

* REDUCE OR ELIMINATE THE ORGANIC CONTAMINATION PRESENT IN SEDIMENTS THE POND, AND ON-SITE TRIBUTARIES OF BROOKS RUN TO CLEANUP LEVELS ESTABLISHED FOR ON-SITE FUTURE RESIDENTS (2.2 PPM CPNAS BASED ON 1 X 10-6 LIFETIME CANCER RISK) AND PREVENT OFF-SITE MIGRATION OF CONTAMINANTS VIA THE SEDIMENT MIGRATION PATHWAY.

* REDUCE OR ELIMINATE ORGANIC CONTAMINATION IN SITE SUBSURFACE SOILS TO THE CLEANUP LEVEL ESTABLISHED FROM THE GROUNDWATER INFILTRATION MODEL (1 PPM CPNA BASED ON 1 X 10-6 LIFETIME CANCER RISK).

* PUMPING, COLLECTION, AND TREATMENT OF CONTAMINATED LIQUIDS FROM THE ONSITE POND, THE POND DISCHARGE, AND THE SHALLOW GROUNDWATER (INSIDE THE CONTAINMENT AREA). TREATED WATER WILL BE DISCHARGED TO THE POND TRIBUTARY AFTER TREATMENT TO LEVELS TO BE ESTABLISHED IN ACCORDANCE WITH APPROPRIATE ARARS.

* REDUCE OR ELIMINATE THE THREAT TO THE LOCAL ENVIRONMENT FROM EXISTING CONTAMINATED STORAGE/PROCESS TANKS AND PROCESS EQUIPMENT THROUGH DEMOLITION/REMEDIATION OF THESE AND ANY ASSOCIATED ORGANIC CONTENTS.

THE VOLUME OF SURFACE SOILS, SEDIMENTS, AND SUBSURFACE SOILS EXCEEDING CONTAMINANT CONCENTRATIONS ABOVE THE ESTABLISHED RISK BASED CLEANUP LEVELS WERE ESTIMATED FOR EACH AREA OF THE SITE AS FOLLOWS:

. UPPER SITE - VOLUME WAS ESTIMATED ASSUMING REMOVAL OF TOP SIX INCHES OVER 4.9 ACRES. ESTIMATED VOLUME IS 4,000 CUBIC YARDS.

. NORTHEAST TANK AREA - VOLUME WAS ESTIMATED ASSUMING REMOVAL OF TOP SIX INCHES OVER FOUR ACRES. ESTIMATED VOLUME IS 3,200 CUBIC YARDS.

. LAND TREATMENT AREA - VOLUME WAS ESTIMATED ASSUMING REMOVAL OF TOP THREE FEET OVER 2.9 ACRES. ESTIMATED VOLUME IS 1,400 CUBIC YARDS.

. SUBSURFACE SOILS/CONTAINED AREA - VOLUME WAS ESTIMATED ASSUMING REMOVAL DOWN TO THE CLAY AND SILT LAYER OVER AN AREA OF 3.3 ACRES. ESTIMATED VOLUME IS 90,000 CUBIC YARDS.

. PROCESS AREA - VOLUME WAS ESTIMATED ASSUMING REMOVAL OF THE TOP SIX INCHES OF SOIL OVER 2.7 ACRES. ESTIMATED VOLUME IS 2,000 CUBIC YARDS.

. WEST TRIBUTARY - VOLUME WAS ESTIMATED ASSUMING STREAM EXCAVATION ONE-FOOT DEEP BY FIVE-FEET WIDE TO 1900 FEET DOWNSTREAM OF THE ON-SITE POND. VOLUME IS ESTIMATED TO BE 1,000 CUBIC YARDS; HOWEVER, THIS IS MOST LIKELY A MAXIMUM VOLUME AND MAY BE LESS TO MINIMIZE DISTURBANCE TO WETLANDS.

THE TOTAL VOLUME OF CONTAMINATED SOILS AND SEDIMENTS AT THE SOUTHERN MARYLAND WOOD TREATING SITE IS ESTIMATED TO BE 102,000 CUBIC YARDS.

#AE
ALTERNATIVES EVALUATION

THE RI/FS FOR THE SMWT SITE SCREENED A LARGE NUMBER OF ALTERNATIVES WHICH COULD POTENTIALLY ACHIEVE THE REMEDIAL OBJECTIVES AT THIS SITE, I.E., REDUCTION OF CONTAMINANT LEVELS IN ON-SITE SOILS, SEDIMENTS, AND GROUND WATER TO LEVELS WHICH ELIMINATE UNACCEPTABLE RISK TO HUMAN HEALTH OR THE ENVIRONMENT.

A. PRELIMINARY SCREENING

DURING THE PRELIMINARY SCREENING PROCESS CERTAIN ALTERNATIVES WERE ELIMINATED FROM FURTHER CONSIDERATION FOR APPLICABILITY AT THIS SITE. EACH ELIMINATED ALTERNATIVE AND THE REASON FOR ITS ELIMINATION ARE LISTED BELOW:

ALTERNATIVE	REASON FOR ELIMINATION FROM DETAILED ANALYSIS
SOILADMIXTURES CAP	LESS COSTLY, EQUALLY EFFECTIVE MATERIALS ARE AVAILABLE FOR CAPPING.
IN-SITU ABSORPTION	INSUFFICIENT TECHNOLOGY; SUITABLE ONLY FOR TEMPORARY REMEDIATION. TECHNICAL PROBLEMS WITH CLOGGING AND SATURATION OF TREATMENT BEDS.
SUPERCRITICAL EXTRACTION	INSUFFICIENT INFORMATION AVAILABLE FOR PRELIMINARY ASSESSMENT.
PYROLYSIS	INSUFFICIENT DATA AVAILABLE. FOR THIS TECHNOLOGY. CANNOT ACCEPT SLUDGE-TYPE MATERIAL. NO DATA AVAILABLE FOR DIOXIN WASTES.
WET AIR OXIDATION	LIMITED INFORMATION FOR HAZARDOUS WASTE APPLICATION. LIMITED TO PUMPABLE AQUEOUS WASTES. NOT RECOMMENDED FOR HALOGENATED ORGANIC AROMATICS.
MACROENCAPSULATION	POTENTIAL LEACHING PROBLEMS. MAY REQUIRE DISPOSAL IN RCRA LANDFILL.
ION EXCHANGE	RESTRICTIONS ON SOLIDS AND ORGANISMS CONTENTS OF WASTES. PROBLEMS WITH CLOGGING AND REGENERATION OF RESIN MATERIAL. HIGH COSTS
MEMBRANE SEPARATION	LIMITED TO TREATMENT OF AQUEOUS STREAMS WITH LOW ORGANIC CONCENTRATIONS. MEMBRANE CLOGGING PROBLEMS. CONCENTRATED WASTE STREAM NEED DISPOSAL.

B. DEVELOPMENT AND DESCRIPTION OF REMEDIAL ACTION ALTERNATIVES

REMEDIAL ACTION ALTERNATIVES WERE FORMULATED TO ADDRESS THE NVIRONMENTAL ISSUES AND CONTAMINANT PATHWAYS RELATED TO THE SOUTHERN ARYLAND WOOD TREATING SITE. ALTERNATIVES WERE DEVELOPED BY APPLYING ECHNOLOGIES TO THE SITE SINGLY OR IN COMBINATION, BASED ON PREVIOUSLY EVELOPED REMEDIAL OBJECTIVES.

WITH RESPECT TO THE SMWT SITE, MOST OF THE REMEDIAL ACTION TECHNOLGIES THAT REMAIN AFTER SCREENING ARE UNDER THE SOURCE CONTROL CLASSIFICATION (VERSUS MIGRATION MANAGEMENT). THIS IS BECAUSE THE SITE ONTAMINATION AND CONTAMINANT PATHWAYS CAN BEST BE ADDRESSED ON-SITE. ANAGEMENT OF MIGRATION AT THE SMWT SITE APPLIES TO THE CONTAMINATION HAT HAS MIGRATED OFF-SITE VIA SEDIMENT TRANSPORT MECHANISMS.

EIGHT REMEDIAL ALTERNATIVES HAVE BEEN RETAINED FOR DETAILED VALUATION. A DESCRIPTION OF EACH ALTERNATIVE FOLLOWS, INCLUDING AN ESTIMATE OF THE PRESENT WORTH COST OF REMEDIATION AND THE PRESENT COST OF OPERATION AND MAINTENANCE OF EACH.

. ALTERNATIVE 1: NO ACTION

PRESENT WORTH COST OF REMEDIATION: $114,000
PRESENT WORTH COSTS OF O & M: $107,000

THE NO ACTION ALTERNATIVE IS A BASELINE REMEDIAL ALTERNATIVE AGAINST WHICH OTHER ALTERNATIVES MAY BE COMPARED. UNDER THE NO ACTION ALTERNATIVE, NO ADDITIONAL MEASURES WILL BE USED TO REMEDIATE CONTAMINANT SOURCES OR THEIR POTENTIAL MIGRATION PATHWAYS. THE TWO MAJOR COMPONENTS OF THIS ALTERNATIVE ARE:

* UPGRADE OF SITE SECURITY INCLUDING THE INSTALLATION OF FENCING AROUND THE WEST TRIBUTARY TO RESTRICT PUBLIC ACCESS.

* IMPLEMENTATION OF A LONG-TERM QUARTERLY GROUNDWATER/SURFACE WATER MONITORING PROGRAM.

IMPLEMENTATION OF ONLY THE ABOVE REMEDIAL ACTIVITIES AT THE SITE ALLOWS THE EXISTING CONTAMINANT SOURCES AND MIGRATION PATHWAYS TO REMAIN IN PLACE. CURRENT ENVIRONMENTAL CONDITIONS WILL REMAIN UNCHANGED. INFILTRATION OF PRECIPITATION THROUGH THE SURFACE SOILS, THE FLOW OF GROUNDWATER THROUGH SUBSURFACE SOILS, AND THE SURFACE WATER TRANSPORT OF SEDIMENTS WILL CONTINUE TO RESULT IN THE MIGRATION OF CONTAMINATION TO OFF-SITE LOCATIONS.

II. ALTERNATIVE 2: ON-SITE THERMAL TREATMENT

PRESENT WORTH COSTS OF REMEDIATION: $38,163,00
PRESENT WORTH COSTS OF O & M: $44,000

THIS ALTERNATIVE CONSISTS OF ON-SITE THERMAL TREATMENT OF EXCAVATED SOILS, SEDIMENTS, AND OTHER MATERIALS AT THE SITE THAT EXHIBIT CONCENTRATIONS OF CONTAMINANTS ABOVE THE RISK BASED LEVELS ESTABLISHED FOR THIS SITE. SOILS REMAINING IN THE GROUND WOULD BE COVERED WITH CLEAN FILL AND POSSIBLY BACKFILLED WITH NON-HAZARDOUS ASH FROM THE INCINERATION PROCESS. GROUNDWATER AND SURFACE WATER WOULD BE TREATED AND DISCHARGED ON-SITE.

THE MAJOR COMPONENTS OF THIS ALTERNATIVE INCLUDE:

* DREDGING OF ALL CONTAMINATED SEDIMENTS SURFACE AND SUBSURFACE SOILS TO CLEANUP LEVELS ESTABLISHED FOR THIS SITE.

* CONTROL OF OFF-SITE SOIL TRANSPORT.

* INSTALLATION OF A SLURRY WALL (OR OTHER MEANS OF CONTAINMENT) FOR CONTROL OF GROUNDWATER MIGRATION THROUGH THE POND/PROCESS AREA.

* DEWATERING OF THE CONTAINED AREA BY PUMPING AND TREATING CONTAMINATED GROUND AND SURFACE WATER.

* EXCAVATION OF SURFACE AND SUBSURFACE SOILS IN THE POND/ PROCESS AND LAND TREATMENT AREAS; SURFACE SOILS IN THE UPPER SITE AND NORTHEAST TANK AREA; AND DREDGING OF SEDIMENTS IN THE POND AND WEST TRIBUTARY.

* ON-SITE INCINERATION OF CONTAMINATED MATERIALS AND ON-SITE DISPOSAL OF INCINERATOR ASH IN PREVIOUSLY EXCAVATED AREAS.

* BACKFILL, REGRADE, AND REVEGETATE, WHERE NECESSARY.

* CONCURRENT AND POST-TREATMENT GROUNDWATER/SURFACE WATER/ SEDIMENT MONITORING AND BIOLOGICAL ASSESSMENT.

THIS ALTERNATIVE WILL VIRTUALLY ELIMINATE ALL ON-SITE SOURCES OF ORGANIC CONTAMINANTS AND THEREBY REDUCE SUBSEQUENT IMPACT TO OFF-SITE AREAS; IT IS ALSO EXPECTED TO MEET OR EXCEED APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS). SOME TREATABILITY STUDIES MAY BE REQUIRED TO DETERMINE THE OPTIMUM WATER TREATMENT TECHNOLOGY AND A TRIAL BURN OF THE HAZARDOUS WASTE WOULD BE CONDUCTED TO DEMONSTRATE DESTRUCTION EFFICIENCY FOR THE ORGANIC CONSTITUENTS IN THE SOILS AND DIOXINS IN THE TANK CONTENTS. EPA EXPECTS THAT THE RESIDUAL ASH FROM THIS PROCESS WILL QUALIFY FOR HAZARDOUS WASTE DELISTING PRIOR TO BACKFILLING AT THE SITE PURSUANT TO 40 CFR 261.22.

III. ALTERNATIVE 3: SOIL WASHING/EXTRACTION

PRESENT WORTH COSTS OF REMEDIATION: $25,147,000
PRESENT WORTH COSTS OF O & M: $48,000

THIS ALTERNATIVE CONSISTS OF ON-SITE TREATMENT OF EXCAVATED SOILS AND SEDIMENTS AT THE SITE THAT EXHIBIT CONCENTRATIONS OF CONTAMINANTS ABOVE THE RISK-BASED LEVELS ESTABLISHED FOR THIS SITE.

THE MAJOR COMPONENTS OF THIS ALTERNATIVE INCLUDE:

* DREDGING OF CONTAMINATED SEDIMENTS, SURFACE, AND SUBSURFACE SOILS.

* MANAGEMENT OF OFF-SITE SOIL TRANSPORT.

* INSTALLATION OF A SLURRY WALL TO CONTROL GROUND WATER MIGRATION.

* DEWATERING THE CONTAINED AREA; PUMPING AND TREATING CONTAMINATED GROUNDWATER/SURFACE WATER.

* EXCAVATION OF SURFACE AND SUBSURFACE SOILS FROM THE POND/PROCESS AREAS, LAND TREATMENT AREA, AND UPPER SITE AND NORTHEAST TANK AREA. DREDGING OF SEDIMENTS IN THE POND AND WEST TRIBUTARY.

* ON-SITE SOIL WASHING/EXTRACTION OF CONTAMINATED MATERIALS USING WATER/CHEMICAL SOLUTIONS.

* ON-SITE TREATMENT OF SOIL WASHING ELUTRIATE STREAM USING CONVENTIONAL WASTEWATER TREATMENT METHODS.

* ON-SITE DISCHARGE OF TREATED PROCESS WASTEWATER.

* ON-SITE INCINERATION OF TANK CONTENTS AND DISPOSAL OF ASH RESIDUE ONSITE.

* BACKFILL, REGRADE, AND REVEGETATE, WHERE NECESSARY.

* GROUNDWATER MONITORING.

THIS ALTERNATIVE WILL VIRTUALLY ELIMINATE THE ON-SITE SOURCES OF CONTAMINATION AND REDUCE THE IMPACT TO OFF-SITE AREAS.

LABORATORY AND PILOT-SCALE TESTING TO DETERMINE THE OPTIMUM WASHING SOLUTION, FIELD OPERATING PARAMETERS, ETC., WOULD BE NEEDED BEFORE IMPLEMENTING THIS ALTERNATIVE.

IV. ALTERNATIVE 4: IN SITU SOIL FLUSHING/BIORECLAMATION

PRESENT WORTH OF REMEDIATION COSTS: $30,991,000
PRESENT WORTH OF O & M COSTS: $25,000

THIS ALTERNATIVE CONSISTS OF IN-SITU TREATMENT OF THE CONTAMINATED MATERIALS (ASSOCIATED WITH THE AREA BOUNDED BY THE PROCESS AREA, THE FRESHWATER POND, AND THE ARE JUST EAST OF THE EXCAVATED LAGOONS) BY SOIL FLUSHING, FOLLOWED BY IN-SITU BIORECLAMATION. INCLUDED IN THIS ALTERNATIVE IS THE ON-SITE LANDFARMING OF SURFACE SOILS FROM THE UPPER SITE AND NORTHEAST TANK AREA, AND SEDIMENTS FROM THE WEST TRIBUTARY AND THE POND/PROCESS AREA. THE LAND FARMING OF THESE SOILS WOULD OCCUR IN THE EXISTING LAND TREATMENT SECTION OF THE SITE. OTHER MAJOR COMPONENTS OF THIS ALTERNATIVE INCLUDE:

* RECOVERY OF THE PRODUCT LAYER LOCATED JUST ABOVE THE CLAY IN THE EXCAVATED LAGOON AND EASTERN POND AREAS.

* TREATMENT OF GROUNDWATER/SURFACE WATER FROM PRODUCT RECOVERY AND DREDGING OPERATIONS AND DISCHARGE ON-SITE.

* INSTALLATION OF SLURRY WALL TO PREVENT GROUNDWATER MIGRATION.

* IN SITU SOIL FLUSHING WITHIN CONTAINMENT AREA.

  - INJECTION/RECOVERY WELLS
  - BIODEGRADABLE SURFACTANT
  - TREATMENT SYSTEM TO REMOVE CONTAMINANTS FROM WASHING SOLUTION
  - DISPOSAL OF TREATED WASTEWATER

* IN SITU BIODEGRADATION IN THE CONTAINMENT AREA FOLLOWING THE IN-SITU FLUSHING.

* GROUNDWATER MONITORING.

* ON-SITE LAND TREATMENT OF EXCAVATED SOILS FROM VARIOUS SITE AREAS.

* ON-SITE INCINERATION OF TANK CONTENTS AND ONSITE DISPOSAL OF ASH RESIDUE.

TREATABILITY STUDIES WOULD BE REQUIRED TO DETERMINE THE EFFECTIVENESS OF THIS ALTERNATIVE.

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TABLES AND ATTACHMENTS

TABLE 1 OVERVIEW OF PHASE I RI ACTIVITIES

OBJECTIVE	SCOPE ACTIVITIES
DETERMINE THE LOCATION OF MONITOR WELLS AND SOIL SAMPLING LOCATIONS.	GEOPHYSICAL INVESTIGATION USING GROUND PENETRATING RADAR AND TERRAIN CONDUCTIVITY.
DETERMINE GROUNDWATER FLOW RATE AND DIRECTION FROM EXISTING ON-SITE WELLS.	CONDUCT PERMEABILITY TESTS AND MEASURE WATER LEVEL ELEVATIONS.
DEFINE ANALYTICAL REQUIREMENTS	COLLECTION OF TWO SOIL SAMPLES AND ONE SEDIMENT SAMPLE FROM AREAS EXPECTED TO BE HIGHLY CONTAMINATED. ANALYSIS OF THESE SAMPLES FOR HAZARDOUS SUBSTANCE LIST (HSL) PARAMETERS.
DEVELOP A RAPID-TURN -AROUND FIELD SCREENING METHOD FOR PNAS.	LABORATORY TESTING TO DEVELOP AND VALIDATE THE EXTRACTION AND ANALYTICAL TECHNIQUES.

TABLE 2 OVERVIEW OF PHASE II RI ACTIVITIES

OBJECTIVE	SCOPE ACTIVITIES
CHARACTERIZE ON-SITE AND LOCAL AIR QUALITY.	ONE ROUND OF AIR SAMPLING WITH ANALYSIS FOR VOLATILE ORGANIC COMPOUNDS, PNAS AND PENTACHLOROPHENOL.
	REAL-TIME AIR MONITORING FOR VOLATILE ORGANICS USING HNU AND/OR OVA AND FOR RESPIRABLE DUST USING A MINI-RAM.
DEFINE THE TYPE, DEGREE, AND EXTENT OF SOIL CON -TAMINATION. UNDERSTAND THE LOCAL STRATIGRAPHY.	CONSTRUCTION OF SOIL BORINGS AND TESTS PITS, AND COLLECT -TION OF SOIL SAMPLES.
	ANALYSIS OF SOIL SAMPLES BY ON-SITE PNA SCREENING, LABORATORY ANALYTICAL METHODS, AND GEOTECHNICAL TESTS.
DEFINE THE TYPE, DEGREE AND EXTENT OF SHALLOW GROUNDWATER CONTAMINATION DEFINE SHALLOW GROUNDWATER FLOW DIRECTION.	INSTALLATION OF MONITOR WELLS.
	ANALYSIS OF GROUNDWATER SAMPLES BY ON-SITE PNA SCREENING AND LABORATORY ANALYTICAL METHODS.
INVESTIGATE THE IMPACT OF THE SITE ON LOCAL RESIDEN -TIAL WELLS.	SAMPLING AND ANALYSIS OF SELECTED RESIDENTIAL WELLS.
EVALUATE THE ROLE OF SURFACE WATERS AS A CONTAMINANT MIGRATION PATHWAY.	SAMPLING OF SURFACE WATERS AND SEDIMENTS FROM THE EAST AND WEST TRIBUTARIES, BROOKS RUN, AND MCINTOSH RUN ANALYSIS OF SAMPLES BY PNA SCREENING AND LABORATORY ANALYTICAL METHODS.
CHARACTERIZE THE QUANTI -TIES AND TYPES OF MATE -RIALS IN ON-SITE TANKS	SAMPLING AND ANALYSIS OF TANKS AND VOLUMETRIC DETER -MINATION OF TANK CONTENTS.

TABLE 3 OVERVIEW OF PHASE III RI ACTIVITY

OBJECTIVE	SCOPE ACTIVITIES
CONFIRM GROUNDWATER FLOW DIRECTION NEAR THE FRESHWATER POND.	INSTALL ONE SHALLOW WELL NORTHWEST OF THE FRESHWATER POND.
FURTHER EVALUATE THE TYPE, DEGREE, AND EXTENT OF SHALLOW GROUNDWATER CONTAMINATION	SAMPLE THE ONE NEWLY -INSTALLED SHALLOW PHASE III WELL AND RESAMPLE THE 12 EXISTING WELLS.
EVALUATE THE POTENTIAL FOR MIGRATION OF CONTAMINATION TO LOWER WATER-BEARING ZONES.	INSTALL AND SAMPLE THREE DEEP WELLS TO THE FIRST WATER-BEAR -ING ZONE BELOW THE UPPER AQUIFER.
DETERMINE THE LEVEL OF CON -TAMINATION OF THE ON-SITE BUILDINGS AND SHEDS.	OBTAIN SURFACE SAMPLES OF ON-SITE BUILDINGS AND SHEDS.
DETERMINE THE PRESENCE OF DIOXINS/FURANS IN SITE GROUND -WATER,SUBSURFACE SOILS, AND BUILDINGS.	ANALYZE SAMPLES FROM GROUNDWATER,SUB -SURFACE SOILS,AND BUILDINGS FOR DIOXIN -FURANS.
EVALUATE THE TECHNICAL FEASIBILITY OF CONSTRUC -TION TECHNOLOGIES PROPOSED IN THE REMEDIAL ALTERNATIVES.	INSTALL FOUR SHALLOW SOIL BORINGS TO OB -TAIN SPLIT-SPOON SAMPLES FOR GEOLOGIC LOGGING AND SHELBY TUBE SAMPLES FOR GEOTECHNICAL ANALYSIS.

TABLE 5 ORGANIC COMPOUNDS MOST FREQUENTLY IDENTIFIED IN SURFACE SOIL SAMPLES

VOLATILE ORGANIC COMPOUNDS	POLYNUCLEAR AROMATIC HYDROCARBONS	OTHER BASE/NEUTRAL EXTRACTABLES
ACETONE	FLUROANTHENE	DIBENZOFURAN
TOLUENE	PYRENE	
ETHYLBENZENE	BENZO(A) ANTHRACENE	
STYRENE	BENZO(A) PYRENE	
XYLENES		

TABLE 7 ORGANIC COMPOUNDS MOST FREQUENTLY IDENTIFIED IN SUBSURFACE SOIL SAMPLES

VOLATILE ORGANIC COMPOUNDS	POLYNUCLEAR AROMATICS HYDROCARBONS
TOLUENE	NAPHTHALENE
ETHYLBENZENE	2-METHYLNATHALENE
STYRENE	ACENAPTHENE
XYLENES	FLUORENE
	PHENANTHRENE
	FLUORANTHENE
	PYRENE
	PYRENE(K)FLUORANTHENE

OTHER

TABLE 8 SUMMARY OF DIOXIN/FURAN RESULTS FOR SURFACES SOIL SAMPLES

AREA	SAMPLE NUMBER	TOTAL TEF (UG/KG)
UPPER SITE	B1-001	0.000
	SS3-001	0.000
NORTHEAST TANK	SS6-002	0.000
	SS6-003	0.000
	T10-002	0.017
	T10-001	0.036
FRESHWATER POND	B2-001	0.000
LAND TREATMENT	B3-001	0.426
	B4-001	0.488
PROCESS	B7-001	0.006
	B10-001	0.024
	B9-001	0.765
EXCAVATED LAGOONS	B13-001	0.079
	B11-001	0.161

TABLE 13 ORGANIC COMPOUNDS MOST FREQUENTLY IDENTIFIED IN SUBSURFACE SOIL SAMPLES

VOLATILE ORGANIC COMPOUNDS	POLYNUCLEAR AROMATICS HYDROCARBONS
TOLUENE	NAPTHALENE
ETHYLBENZENE	2-METHYNAPTHALENE
STYRENE	ACENAPHTHENE
XYLENES	FLUORENE
	PHENANTHRENE
	FLUORANTHENE
	PYRENE
	PYRENE (K)FLUORANTHENE
	OTHER
OTHER ACID EXTRACTABLES	BASE/NEUTRAL EXTRACTABLES
PHENOL	DIBENZOFURAN
22,4-DIMETHYLPHENOL	

OTHER ACID EXTRACTABLES	BASE/NEUTRAL EXTRACTABLES
PHENOL	DIBENZOFURAN
22,4-DIMETHYLPHENOL	

VOLATILE ORGANIC COMPOUNDS

TABLE 13

SURFACE WATER	SEDIMENTS
BENZENE	BENZENE
TOLUENE	TOLUENE
ETHYLBENZENE	ETHYLBENZENE
	STYRENE
	XYLENES
	PYRENE

PNAS

SURFACE WATER	SEDIMENTS
FLUORENE	FLUORENE
FLUORAN	PHENAN
-THENE	-THRENE
FLUORAN	
-THENE	
PYRENE	
BENZO(A)	
ANTHRACENE	
BENZO(K)	
FLUOANTHENE	
BENZO(A)	
-PYRENE	

OTHER ACID EXTRACTABLES

SURFACE WATER	SEDIMENTS
PHENOL	
2,4-DI	
-METHYL	
-PHENOL	

OTHER BASE NEUTRAL EXTRACTABLES

SURFACE WATER	SEDIMENTS
DIBENZO	DIBENZO
-FURAN	-FURAN

ACTION - SPECIFIC & LOCATION SPECIFIC ARARS MATRIX

TABLE 14

	ALT.1 ACTION/ARAR	NO ACTION
1.	DISCHARGE OF DREDGE/FILL MATERIAL INTO NAVIGATABLE WATERS.	N/A
2.	DISCHARGE OF TREATED GROUND WATER AND SUR -FACE WATER INTO POND.	N/A
3.	ON-SITE INCINE -RATOR FOR TREAT -MENT OF SOILS AND/OR TANK CONTENTS (HAZARD -OUS WASTES.	N/A
4.	DISPOSAL OF ASH FROM INCINERATION OF SOILS AND/OR TANK CONTENTS ON-SITE.	N/A

ACTION - SPECIFIC & LOCATION SPECIFIC ARARS MATRIX
TABLE 14 (CONT)

ALT.2 - ON -SITE THERMAL TREATMENT	ALT.3 SOIL WASHING /EXTRACTION
DREDGING OF CONTAMINATED SEDIMENTS IN POND AND WEST TRIBUTARY (AND OF SAME) BACKFILLING MAY CONSTITUTE SUCH A DISCHARGE AND ,IF SO, MUST BE PERFORMED IN ACCORDANCE WITH SUBSTANTIVE REQUIREMENTS OF CLEAN WATER ACT {404; 40 C.F.R{230.10; 33 CFR {{320.330.	SAME AS ALT.2
DIRECT DISCHARGE OF TREATED GROUNDWATER AND SURFACE WATER INTO POND, A "WATER OF THE UNITED STATES",MUST SATISFY SUBSTANTIVE STANDARDS OF CLEAN WATER ACT {402 (A)(1). CLEAN WATER ACT{304 WATER QUALITY CRITERIA; CLEAN WATER ACT{302 WATER QUALITY STANDARDS; IMPLEMENTING REG -ULATIONS AT 40 CFR {{122, 125, AND 136.	SAME AS ALT.2
MUST BE PERFORMED IN ACCORDANCE WITH APPLI -CABLE CONSTRUCTION AND OPERATION REQUIREMENTS OF 40 CFR {264.1- .178 AND SUBPART O.	N/A
SEE ACTION #7 AND #20	SAME AS ALT 2.

ACTION - SPECIFIC & LOCATION SPECIFIC ARARS MATRIX
TABLE 14 (CONT)

	ALT4. - IN-SITU SOIL FLUSHING BIORECLAMATION	ALT5. IN-SITU VITRIFICATION
1.	SAME AS ALT 2.	SAME AS ALT 2.
2.	SAME AS ALT 2.	SAME AS ALT 2.
3.	N/A	N/A
4.	SAME AS ALT 2.	SAME AS ALT 2.

ACTION - SPECIFIC & LOCATION SPECIFIC ARARS MATRIX
TABLE 14 (CONT)

CONSTRUCTION & OPERATION OF	ALT #5 IN-SITU VITRIFICATION	ALT.#6 CONTAIN -MENT
5.BACKFILLING, REGRADING VEGETATION OF DREDGED/EXCA -VATED AREAS WITH TREATED SOIL AND/OR CLEAN FILL.	CLEAN FILL ONLY. (SEE ACTION # 1)	SAME AS ALT. #5
6.RELEASE OF AIR EMISSIONS FROM SOIL MOVEMENT AND INCINERATION OF SOILS AND/OR TANK CONTENTS.	SAME AS ALT #2	SAME AS ALT #2
7. LAND DISPOSAL	PLACEMENT OF DREDGED SEDIMENTS & EXCAVATED SOILS FROM OTHER SITE AREAS INTO FORMER WASTE LAGOON AREAS AND FORMER LAND TREATMENT AREAS CONSTITUTES "LAND DISPOSAL"OF LISTED HAZARDOUS WASTES. PLACEMENT OF ASH FROM INCINERATION OF TANK CONTENTS CONSTITUTES "LAND DISPOSAL"OF LISTED HAZARDOUS WASTE. ALL SUCH LAND DISPOSAL MUST BE CONDUCTED IN ACCORD -ANCE WITH RCRA {3004 (E),(G) AND (H),AND 40 CFR 268}.	PLACEMENT OF SOILS FROM FORMER LAND TREATMENT AREA CONSTITUTES "LAND DISPOSAL" OF LISTED HAZARDOUS WASTES.PLACE -MENT OF ASH FROM INCINERA -TION OF TANK CONTENTS CONST -STITUTES "LAND DISPOSAL" OF LISTED HAZARD -OUS WASTES. ALL SUCH LAND DISPOSALS MUST BE CONDUCTED IN ACCORDANCE WITH RCRA SEC -TION 3004 (E) ,(G), AND (H)' AND 40 CFR 268}.

ALT #7 REMOVAL OFF-SITE	ALT #8 RCRA CONTAINMENT
SAME AS ALT. #5	SAME AS ALT #5
SAME AS ALT #2 OFF-SITE THERMAL INCINERATION OF SOILS AND TANK CONTENTS CONSTITUTES "LAND DISPOSAL"OF LISTED HAZARDOUS WASTES.	SAME AS SAME AS PLACEMENT OF SOILS FROM FORMER LAGOON AREA & FORMER LAND TREATMENT "LAND DISPOSAL" OF LISTED HAZARDOUS WASTES. PLACEMENT OF ASH FROM INCINERATOR OF TANK CONTENTS INTO NEW RCRA LANDFILL CONSTITUTES "-LAND DISPOSAL".ALL SUCH LAND DISPOSAL MUST BE CONDUCTED IN ACCORDANCE WITH RCRA SECTION 3004 (E), (G) AND (H) 40 CFR 268.

OFF-SITE DISPOSAL-PLACEMENT
OF SOILS FROM SITES IN OFF-SITE
LANDFILLS CONSTITUTES "LAND DISPOSAL"
OF LISTED HAZARDOUS WASTES.PLACEMENT
OF ASH FROM INCINERATION OF TANK CON
-TENTS CONSTITUTES "LAND DISPOSAL"OF
LISTED HAZARDOUS WASTES. ALL SUCH LAND
DISPOSAL MUST BE CONDUCTED IN ACCORDANCE
WITH RCRA SECTION 3004 (E),(G).

ACTION - SPECIFIC & LOCATION SPECIFIC ARARS MATRIX
TABLE 14 (CONT)

ALTERNATIVE #3 SOIL WASHING/ EXTRACTION	ALTERNATIVE #4 IN-SITU SOIL FLUSHING/BIORECLAMATION
SAME AS ALTERNATIVE #2	SAME AS ALTERNATIVE #2
ALTERNATIVE #5 IN-SITU VITRIFICATION	ALTERNATIVE #6 CONTAINMENT
SAME AS ALTERNATIVE #2	SAME AS ALTERNATIVE #2
ALTERNATIVE #7 REMOVAL OFF-SITE	ALTERNATIVE #8 RCRA CONTAINMENT
SAME AS ALTERNATIVE #2	SAME AS ALTERNATIVE #2

TABLE 14 ACTION/ARAR - CONT'	ALT #6 CONTAINMENT
1.DISCHARGE OF DREDGE/FILL MATERIAL INTO NAVIGATABLE WATERS.	SAME AS ALTERN -ATIVE #2
2.DISCHARGE OF TREATED GROUND -WATER AND SURFACE WATER INTO POND.	SAME AS ALTERN -ATIVE #2
3.ON-SITE INCINERATION FOR TREATMENT OF SOILS AND/ OR TANK CONTENTS (HAZARDOUS WASTES).	N/A
4.DISPOSAL OF ASH FROM INCINERATION OF SOILS AND/OR TANK CONTENTS ON SITE.	SAME AS ALT. #5

ALT #7 REMOVAL OFF-SITE	ALT #8 RCRA CONTAINMENT
SAME AS ALTERN -ATIVE #2	SAME AS ALTERN -ATIVE #2
SAME AS ALTERN -ATIVE #2	SAME AS ALTERN -ATIVE #2
N/A	N/A
SAME AS ALT. #5	SAME AS ALTERN -ATIVE #5 ALTERNATIVE #2

ACTION - SPECIFIC & LOCATION SPECIFIC ARARS MATRIX

TABLE 14 (CONT)

CONSTRUCTION & OPERATION OF	ALT. #1 NO ACTION	ON-SITE THERMAL TREATMENT
5. BACKFILLING, REGRADING, VEGETATION OF DREDGED/EXCA -VATED AREAS WITH TREATED SOIL AND/ OR CLEAN FILL.	N/A	SEE ACTION #1 FOR BACKFILLING WITH CLEANFILL SEE ACTION #7 AND #20 FOR BACKFILLING WITH TREATED SOILS.
6. RELEASE OF AIR EMISSIONS FROM SOIL MOVEMENT AND INCINERATION SOILS AND/OR TANK CONTENTS	N/A	ANY AIR EMISSIONS GENERATED BY THE REMEDIAL ALTERNATIVE MUST BE IN COMPLIANCE WITH MARYLAND'S STATE IMPLEMENTATION PLAN.
7. LAND DISPOSAL OF HAZARDOUS WASTE	N/A N/A	PLACEMENT OF ASH FROM INCINERATION OF CONTAMINATED TENTS CONSTITUTES "LAND DISPOSAL" OF WASTES. MUST BE CONDUCTED IN ACCORDANCE WITH RCRA SECTIONS 3004 (E), (G)(H) AND 40 C.F.R. PART 268.

ACTION - SPECIFIC & LOCATION SPECIFIC ARARS MATRIX

TABLE 14 (CONT)

	ALTERNATIVE #3 SOIL WASHING/EXTRACTION	ALTERNATIVE #4 IN-SITU SOIL FLUSHING
5.	SAME AS ALT.#2	SAME AS ALT. #2
6.	SAME AS ALT.#2	
7.	PLACEMENT OF EXCAVATED SITE SOILS AND LAGOON SLUDGES TREATED BY SOIL WASHING CONST -ITUES "LAND DISPOSAL", PLACEMENT OF ASH FROM INCINERATION OF TANK CONTENTS CONSTITUTES "LAND DISPOSAL"OF LISTED HAZARDOUS WASTES. ALL SUCH LAND DISPOSALS MUST BE CONDUCTED IN ACCORDANCE WITH RCRA {3004(E), (G) AND (H) AND AND 40 C.F.R.{268.	PLACEMENT OF SOILS FROM UPPER SITES, IN THE NE TANK AREA,WEST TRIBUTARY AND POND PROCESSING AREA INTO FORMER LAND TREATMENT AREA (A "NEW HAZARDOUS WASTE MANAGEMENT FACILITY" SUBJECT TO REGULATIONS UNDER RCRA) CONSTITUTES "LAND DISPOSAL OF LISTED HAZARDOUS WASTES. BACKFILLING OF OTHER SITE AREAS WITH SOIL TREATED IN FORMER LAND TREATMENT AREA CONSTITUTES LAND DISPOSAL OF THE SAME LISTED AS HAZARDOUS WASTES.PLACEMENT OF ASH FROM INCINERATION OF TANK CONTENTS AND RECOVERED PRODUCT LAYER CONSTITUTES LAND DISPOSAL OF LISTED HAZARDOUS WASTES. ALL SUCH LAND DISPOSAL MUST BE CONDUCTED IN ACCORDANCE WITH RCRA {3004(E),(G), AND (H).

ACTION - SPECIFIC & LOCATION SPECIFIC ARARS MATRIX
TABLE 14 (CONT)

	ALT. #1 NO-ACTION	ALT. #2. ON-SITE THER-MAL TREATMENT
8. CONSTRUCTION OF OR/ OPERATION OF A NEW HAZARDOUS WASTE MANAGEMENT UNIT	N/A	INCINERATOR,TREAT-MENT TANKS FOR GROUND-WATER,SURFACE WATER (AND PROCESS WASTE-WATERS)AND LANDFILL AREA FOR ASH BACKFILLING ARE RCRA REGULATED UNITS WHICH MUST BE CONSTRUCTED AND OPERATED IN ACCORDANCE WITH 40 C.F.R. {264.1-.178 AND SUBPARTS O,J,AND N RESPECTIVELY.
9. CLOSURE OF HAZARDOUS WASTE MANAGEMENT UNIT	FORMER WASTE LAGOONS FORMER PRODUCT TANKS AND FORMER LAND TREAT-MENT AREA ARE RCRA REGULATED UNITS WHICH MUST BE CLOSED IN ACCORDANCE WITH 40 C.F.R. {264.110 -.116 AND 40 C.F.R. {264.228,AND .19.280 RESPECTIVELY.	SAME AS ALTERNATIVE #1. IN ADDITION, INCINERATOR,TREAT-MENT TANKS(S) FOR GROUNDWATER,SURFACE WATER{AND PROCESS WASTEWATERS} AND LANDFILL AREA FOR ASH BACKFILLING ARE RCRA REGULATED UNITS WHICH MUST BE CLOSED IN ACCORDANCE WITH 40 C.F.R. {264.351,.197 AND .310, RESPECTIVELY.

ACTION - SPECIFIC & LOCATION SPECIFIC ARARS MATRIX

TABLE 14 (CONT)

	ALTERNATIVE #1 NO ACTION
10.CLOSURE OF CONTAMINATED AREAS WHICH ARE NOT HAZARDOUS WASTE MANAGE-MENT UNITS	THE CLOSURE STANDARDS OF 40 CFR 264.110-.116 AND .310 (LANDFILLS) ARE "RELEVANT AND APPROPRIATE FOR NON-RCRA -REGULATED AREAS OF THE SITE.
11.POST-CLOSURE CARE OF A HAZARDOUS WASTE MANAGEMENT UNIT.	UNITS DESCRIBED IN ACTION #9 ALTERNATIVE 1,MUST COMPLY WITH ANY APPLICABLE POST-CLOSURE CARE REQUIREMENTS IN 40 CFR 264.288, .197 AND 280.

ALTERNATIVE #2 ON-SITE THERMAL TREATMENT	ALTERNATIVE #3 SOIL WASHING/ EXTRACTION
SAME AS ALTERNATIVE #1	SAME AS ALTERNATIVE #1
SAME AS ALTERNATIVE #1. IN ADDITION UNITS DESCRIBED IN ACTION #9,ALTER-NATIVE #2,MUST COMPLY WITH ANY APPLICABLE POST-CLOSURE CARE RE-QUIREMENTS IN 40 CFR {264.117 -.120 AND 40 CFR 264.351, .197 AND .310,RESPECTIVELY	SAME AS ALTERNATIVE #1. IN ADDITION, UNITS DESCRIBED IN ACTION #9,ALTERNATIVE #3, MUST COMPLY WITH ANY APPLICABLE POST-CLOSURE CARE REQUIRE -MENTS IN 40 CFR {264.351, .197 AND 310, RESPECTIVELY

ACTION - SPECIFIC & LOCATION SPECIFIC ARARS MATRIX
TABLE 14 (CONT)

	ALTERNATIVE #4 IN-SITU SOIL FLUSHING/BIO RECLAMATION	ALTERNATIVE #5 IN-SITU VITRIFICATION
	SAME AS ALTERNATIVE #1	SAME AS ALTERNATIVE #1
	SAME AS ALTERNATIVE #1. IN ADDITION,UNITS DESCRIBED IN ACTION #9, ALTER-NATIVE #4, MUST COMPLY WITH ANY APPLICABLE POST-CLOSURE CARE REQUIREMENTS OF 40 CFR 264.351, .197, .280 AND .310 RESPECTIVELY	SAME AS ALTER-NATIVE #1. IN ADDITION,UNITS DESCRIBED IN ACTION #9, ALTERNATIVE #8, MUST COMPLY WITH ANY APPLI-CABLE POST-CLOSURE CARE REQUIREMENTS OF 40 CFR 264.351, .197 AND .310, RE RESPECTIVELY.

ACTION - SPECIFIC & LOCATION SPECIFIC ARARS MATRIX
TABLE 14 (CONT)

	ALTERNATIVE #7 REMOVAL OFF-SITE	ALTERNATIVE #8 RCRA CONTAINMENT
	SAME AS ALTER-NATIVE #1. IN ADDITION DESCRIBED IN ACTION #9,ALTERNATIVE #7, MUST COMPLY WITH ANY APPLICABLE POST-CLOSURE CARE RE-QUIREMENTS OF 40 CFR {264.351, .197 AND .310, RESPECTIVELY.	SAME AS ALTERNATIVE #1 IN ADDITION, UNITS DESCRIBED IN ACTION #9, ALTERNATIVE #8,MUST COMPLY WITH ANY APPLI-CABLE POST-CLOSURE CARE REQUIREMENTS OF 40 CFR {264.351, .197 AND .310, RESPECTIVELY.
		ALTERNATIVE #6 CONTAINMENT
10.CLOSURE OF CONTAMINATED AREAS WHICH ARE NOT HAZARD-OUS WASTE MANAGEMENT UNITS		SAME AS ALTER-NATIVE #1

ACTION - SPECIFIC & LOCATION SPECIFIC ARARS MATRIX
TABLE 14 (CONT)

ALTERNATIVE #7 REMOVAL OFF-SITE	ALTERNATIVE #8 RCRA CONTAINMENT
SAME AS ALTER- NATIVE #1	SAME AS ALTERNATIVE #1
ALTERNATIVE #5 IN-SITU VITRIFICATION	ALTERNATIVE #6 CONTAINMENT
INCINERATOR TREATMENT TANK FOR GROUND WATER, SURFACE WATER (AND PRO- CESS WASTEWATER LANDFILL AREAS FOR VITRIFICATION AND BACKFILLING OF INCINER- ATOR ASH ARE RCRA REGULATED UNITS WHICH MUST BE CONSTRUCTED AND OPERATED IN ACCORD- ANCE WITH 40 CFR {264.1 - .178 AND SUPPORTS O,J AND N, RESPECTIVELY	INCINERATOR,TREATMENT TANK(S) FOR GROUND WATER SURFACE WATER (AND PROCESS WATERS),LANDFILL AREA FOR EXCAVATED SOILS, SEDIMENTS AND ASH ARE RCRA REGULATED UNITS WHICH MUST BE CON -STRUCTED AND OPERATED IN ACCORDING WITH 40 CFR {264.1-.178 AND SUBPARTS O,J AND N, RESPECTIVELY.
SAME AS ALTERNATIVE #1. IN ADDITION,INCINERATOR, TREATMENT TANK(S) FOR GROUND WATER, SURFACE WATER(AND PROCESS WASTE- WATERS),LANDFILL AREAS FOR VITRIFICATION AND BACKFILLING OF ASH ARE RCRA REGULATED UNITS WHICH MUST BE CLOSED IN ACCORDANCE WITH 40 CFR {264.110- .116 AND 40 CFR {264.351, .197 AND .310	SAME AS ALTERNATIVE #1. IN ADDITION,INCINERATOR, TREATMENT TANK(S) FOR GROUNDWATER,SURFACE WATER (AND PROCESS WASTEWATER), AND LANDFILL CONTAINMENT) AREA FOR SOILS AND ASH BACK -FILLING ARE RCRA REGULATED UNITS WHICH MUST BE CLOSED IN ACCORDANCE WITH 40 CFR {264.110 - .178 AND 40 CFR {264.351, .197 AND .310, RESPECTIVELY.

ACTION - SPECIFIC & LOCATION SPECIFIC ARARS MATRIX
TABLE 14 (CONT)

ALTERNATIVE #7 REMOVAL OFF-SITE	ALTERNATIVE #8 RCRA CONTAINMENT
INCINERATOR,TREATMENT TANK(S) FOR GROUND WATER, SURFACE WATER(AND PROCESS WATER), (LANDFILL FOR BACK -FILLING OF ASH) ARE RCRA REGULATED UNITS WHICH MUST BE CONSTRUCTED AND OPERATED IN ACCORDANCE WITH 40 CFR {264.1 - .178 AND SUBPARTS O, J (AND N) RESPECTIVELY.	INCINERATOR, TREATMENT TANK(S) FOR GROUND WATER, SURFACE WATER (AND PROCESS WATER), NEW LANDFILLS ARE RCRA-REGULATED UNITS WHICH MUST BE CONSTRUCTED AND OPERATED IN ACCORDANCE WITH 40 CFR {264.1-.178 AND SUBPARTS O,J AND N, RESPECTIVELY.
ACTION	ALTERNATIVE #1 NO ACTION
12.POST-CLOSURE CARE FOR CON-TAMINATED AREAS WHICH ARE NOT RCRA-REGULATED HAZARDOUS WASTE MANAGEMENTS UNITS	THE POST-CLOSURE CARE REQUIREMENTS OF 40 CFR {264.117 - .120 AND {264.310 ARE "RE -LEVANT AND APPRO -PRIATE" FOR NON RCRA REGULATED AREAS OF THE SITE.
ALTERNATIVE #2 ON-SITE THERMAL TREATMENT	ALTERNATIVE #3 SOIL WASHING/EXTRACTION
SAME AS ALTERNATIVE #1	SAME AS ALTERNATIVE #1
N/A	N/A
ALTERNATIVE #4 IN-SITU SOIL FLUSHING/BIO RECLAMATION	
SAME AS ALTERNATIVE #1	
N/A	
12.ALTERNATIVE #5 IN-SITU VITRIFICATION	ALTERNATIVE #6 CONTAINMENT
SAME AS ALTERNATIVE #1	SAME AS ALTERNATIVE #1
ALTERNATIVE #7 REMOVAL OFF-SITE	ALTERNATIVE #8 RCRA CONTAINMENT
SAME AS ALTERNATIVE #1	SAME AS ALTERNATIVE #1
13.OFF-SITE SHIP -MENT OF HAZARDOUS WASTE (FOR INCINERATION OR LAND DISPOSAL)	N/A

ACTION - SPECIFIC & LOCATION SPECIFIC ARARS MATRIX
TABLE 14 (CONT)

ALTERNATIVE #2 OFF-SITE THERMAL TREATMENT	ALTERNATIVE #3 SOIL WASHING/EXTRACTION
SAME AS ALTERNATIVE #1	SAME AS ALTERNATIVE #1
N/A	N/A
	ALTERNATIVE #4 IN-SITU SOIL FLUSHING/BIO RECLAMATION
	SAME AS ALTERNATIVE #1 N/A
ALTERNATIVE #5	ALTERNATIVE #6
N/A	N/A
ALT #3 SOIL WASHING/ EXTRACTION	ALT #4 IN-SITU SOIL FLUSHING/ BIORECLAMATION
INCINERATOR, SOIL WASHING TANKS(S) FOR GROUNDWATER, SURFACE WATER AND PROCESS WATER, LANDFILL(S) FOR BACKFILLING OF WASHED SOIL AND ASH, ARE RCRA -REGULATED UNITS WHICH MUST BE CONSTRICTED AND OPERATED IN ACCORDANCE WITH 40 CFR {264.1-.178 AND SUBPARTS O,J, AND N, RESPECTIVELY.	INCINERATOR, TREAT -MENT TANKS FOR GROUND -WATER, SURFACE WATER AND PROCESS WASTEWATER, LANDFILL FOR BACKFILLING OF ASH AND TREATED SOILS,LAND TREATMENT AREAS FOR BIORECLAMATION OF TREATED SOILS ARE FOR RCRA -REGULATED UNITS WHICH MUST BE CONSTRICTED AND OPERATED IN ACCORDANCE 40 CFR {264.1-.178 AND SUBPARTS O,J,N AND M RESPECTIVELY.
SAME AS ALTERNATIVE #1. IN ADDITION, INCINERATOR, SOIL WASHING TANK AND TANK(S) FOR TREAT -MENT OF GROUNDWATER, SURFACE WATER {AND PROCESS WASTEWATERS} AND LANDFILL(S) FOR BACKFILLING OF ASH AND WASHED SOIL ARE RCRA-REGULATED UNITS WHICH MUST BE CLOSED IN ACCORDANCE WITH 40 CFR {264.110-.116 AND 40 CFR {264.351, .197 AND .310 RESPECTIVELY.	SAME AS ALTERNATIVE #1. IN ADDITION ,INCINERATOR, TREATMENT TANK(S), GROUNDWATER, SURFACE WATER(AND PROCESS WASTE WATER), LAND TREATMENT AREAS(TO THE EXTENT THEY DIFFER FROM FORMER LAND TREATMENT AREA AND LANDFILL FOR BACKFILLING OF ASH AND ANY TREATED SOIL, ARE RCRA-REGULATED UNITS WHICH MUST BE CLOSED IN ACCORDANCE WITH 40 CFR {264.110-.116 AND 40 CFR {254.351,.197,280 ,AND .310, RESPECTIVELY.

ACTION - SPECIFIC & LOCATION SPECIFIC ARARS MATRIX
TABLE 14 (CONT)

ALTERNATIVE #7	ALTERNATIVE #8
CONTAMINATED SOILS, SEDIMENTS {AND ASH} CONTAINING LISTED HAZARDOUS WASTES F021, U051, U242 AND K001 MUST BE TRANS -PORTED OFF-SITE IN ACCORDANCE WITH SUBSTANTIVE RE -QUIREMENTS OF 40 CFR {264.262 AND 263. IN ADDITION, SUCH WASTES MUST BE HANDLED IN ACCORDANCE WITH CERCLA {121(D) (3).	N/A
14.ACTIONS AT SITE WHICH WOULD REQUIRE THE FACILITY TO OBTAIN A RCRA OPERATING OR POST CLOSURE PERMIT ABSENT A CERCLA CLEAN-UP	CLOSURE OF THE FORMER WASTE LAGOON AREA IN A MANNER OTHER THAN IN ACCORD -ANCE WITH "CLEAN CLOSURE" RE -QUIREMENTS OF 40 CFR {264. 228.(A)(1) WILL REQUIRE A POST CLOSURE PERMIT FOR SUCH UNIT. CLOSURE OF THE FORMER LAND TREATMENT AREA IN A MANNER OTHER THAN IN ACCORDANCE WITH THE REQUIREMENTS OF 40 CFR{264.280(D) WILL REQUIRE A POST-CLOSURE PERMIT FOR SUCH UNIT. POST CLOSURE CARE REQUIREMENTS OF 40 CFR {264.310 ARE "RELEVANT AND APPROPRIATE" FOR CLOSURE OF NON RCRA -REGULATED OF THE SITE. ACCORDINGLY, THE CORRECTIVE ACTION REQUIREMENTS OF RCRA {3004(U), 42 USC { 6924 (U) AND IMPLEMENTING REGULATIONS ARE BOTH APPLICABLE AND RELEVANT.

ACTION - SPECIFIC & LOCATION SPECIFIC ARARS MATRIX
TABLE 14 (CONT)

ALTERNATIVE #2 ON-SITE THERMAL TREATMENT	ALTERNATIVE #3 SOIL WASHING/BIO -RECLAMATION	ALTERNATIVE #4 IN-SOIL FLUSHING/ BIORECLAMATION
SAME AS ALTERNATIVE #1. IN ADDITION, CONSTRUCTION AND OPERATION OF NEW RCRA UNITS DESCRIBED IN ACTION 8, THIS ALTERNATIVE WILL REQUIRE A RCRA OPERATING PERMIT. ACCORDINGLY, THE CORRECTIVE ACTION REQUIREMENTS OF RCRA {3004(U), 42 U.S.C. {6924 (U), AND IMPLEMENTING REGULATIONS ARE BOTH APPLICABLE AND RELEVANT AND APPROPRIATE.	SAME AS ALTERNATIVE #2	SAME AS ALTERNATIVE #2

15.EXCAVATION/ DREDGING OF CONTAMINATED SOILS/SEDIMENTS

ALTERNATIVE #1 NO ACTION	ALTERNATIVE #2 ON-SITE THERMAL TREATMENT
N/A	EXCAVATION/DREDGING OF CONTAMINATED SOILS/SEDIMENTS CONSTITUTES "GENERATION" OF HAZARDOUS WASTE. SEC. 40 C.F.R. 264. GENERATOR MUST COMPLY WITH SUB -STANTIVE REQUIRE -MENTS OF 40 C.F.R. {264.263.
ALTERNATIVE #3 SOIL/WASHING EXTRACTION	ALTERNATIVE #4 IN-SITU SOIL FLUSHING/BIORECLAMATION
SAME AS ALTERNATIVE #2	SAME AS ALTERNATIVE #2

16.SOIL WASHING

ALTERNATIVE #1 NO ACTION	ALTERNATIVE #2 ON-SITE THERMAL TREATMENT
N/A	N/A

ACTION - SPECIFIC & LOCATION SPECIFIC ARARS MATRIX
TABLE 14 (CONT)

ALTERNATIVE #3	ALTERNATIVE #4
SOIL WASHING/ EXTRACTION	IN-SITU SOIL FLUSHING/BIORECLAMATION
SOIL WASHING CONSTITUTES TREATMENT OF HAZARDOUS WASTES IN A TANK. TANK MUST BE CONSTRUCTED AND OPERATED IN ACCORDANCE WITH 40 CFR {264.1-.178 AND SUB -PART J, CLOSED IN ACCORDANCE WITH 40 CFR {264.110-.116 AND .197 AND GIVEN POST-CLOSURE CARE IN ACCORDANCE WITH 40 CFR {264.197.	N/A

ALTERNATIVE #5 IN-SITU VITRIFICATION	ALTERNATIVE #6 CONTAINMENT
SAME AS ALTERNATIVE #2	SAME AS ALTERNATIVE #2

ALTERNATIVE #7 REMOVAL OFF-SITE	ALTERNATIVE #8 RCRA CONTAINMENT
SAME AS ALTERNATIVE #2	SAME AS ALTERNATIVE #2

17.IN-SITU
SOIL FLUSHING

ACTION - SPECIFIC & LOCATION SPECIFIC ARARS MATRIX
TABLE 14 (CONT)

ALTERNATIVE #1 NO ACTION	ALTERNATIVE #2 ON-SITE THERMAL TREATMENT
N/A	N/A
ALTERNATIVE #3 SOIL WASHING/ EXTRACTION	ALTERNATIVE #4 IN-SITU SOIL FLUSHING/ BIORECLAMATION
N/A	NO ARARS IDENTIFIED.
ALTERNATIVE #5 IN-SITU VITRIFICATION	ALTERNATIVE #6 CONTAINMENT
N/A	N/A
ALTERNATIVE #7 REMOVAL OFF-SITE	ALTERNATIVE #8 RCRA CONTAINMENT
N/A	N/A
18.BIORECLAMATION ALTERNATIVE #1 NO ACTION	ALTERNATIVE #2 ON-SITE THERMAL TREATMENT
N/A	N/A
ALTERNATIVE #3 SOIL WASHING/ EXTRACTION	ALTERNATIVE #4 IN-SITU SOIL FLUSHING/ BIORECLAMATION
N/A	BIORECLAMATION OF CONTAMINATED SOILS, SEDIMENTS CONSTITUTES "LAND TREATMENT" OF HAZARDOUS WASTES. LAND TREATMENT UNIT(S) MUST BE CONSTRUCTED AND OPERATED IN ACCORDANCE WITH 40 CFR {264.1-.178 AND SUBPART N CLOSED IN ACCORDANCE WITH 40 CFR {264.110-.116 AND .280 AND PROVIDED WITH POST-CLOSURE CARE UNDER 40 CFR {264.117-.120 AND .280.
ALTERNATIVE #5 IN-SITU VITRIFICATION	ALTERNATIVE #6 CONTAINMENT
N/A	N/A
ALTERNATIVE #7 REMOVAL OFF-SITE	ALTERNATIVE #8 RCRA CONTAINMENT
N/A	N/A

19.ON-SITE
INCINERATION
OF CONTAMINATED
SOILS, SEDIMENTS
AND/OR TANK CONTENTS

ALTERNATIVE #1 NO ACTION	ALTERNATIVE #2 ON-SITE THERMAL TREATMENT
N/A	INCINERATION OF CONTENTS MUST BE CONDUCTED IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF 40 CFR {264.1-.178 AND SUBPART O.
ALTERNATIVE #3 SOIL WASHING/ EXTRACTION	ALTERNATIVE #4 IN-SITU SOIL FLUSHING/BIORECLAMATION
SAME AS ALTERNATIVE #2	SAME AS ALTERNATIVE #2
ALTERNATIVE #5 IN-SITU VITRIFICATION	ALTERNATIVE #6 CONTAINMENT
SAME AS ALTERNATIVE #2	SAME AS ALTERNATIVE #2
ALTERNATIVE #7 REMOVAL OFF-SITE	ALTERNATIVE #8 RCRA CONTAINMENT
SAME AS ALTERNATIVE #2	SAME AS ALTERNATIVE #2

20.ON-SITE
CONTAINMENT
(LANDFILLING)
OF CONTAMINATED
SOILS AND SEDIMENTS.

ALTERNATIVE #1 NO ACTION	ALTERNATIVE #2 ON-SITE THERMAL TREATMENT
N/A	BACKFILLING OF ASH FROM INCINERATOR OF CONTAMINATED SOILS, SEDIMENTS AND TANK CONTENTS CONSTITUTES LAND -FILLING OF HAZARDOUS WASTE. LANDFILLING MUST BE CONSTRICTED, OPERATED, CLOSED AND GIVEN POST-CLOSURE CARE IN ACCORDANCE WITH APPLICABLE RE -QUIREMENTS OF 40 CFR {264.1-.178 AND SUBPART M.

ACTION - SPECIFIC & LOCATION SPECIFIC ARARS MATRIX
TABLE 14 (CONT)

ALTERNATIVE #3 SOIL WASHING/ EXTRACTION	ALTERNATIVE #4 IN-SITU SOIL FLUSHING/BIORECLAMATION
BACKFILLING OF WASHED SOILS AND SEDIMENTS AND ASH FROM INCINERATION OF TANK CONTENTS CONSTITUTES LAND-FILLING OF HAZARDOUS WASTE. LANDFILL MUST BE CONSTRUCTED, OPERATED, CLOSED AND GIVEN POST-CLOSURE CARE IN ACCORDANCE WITH APPLICABLE REQUIREMENTS OF 40 CFR {264.1-.178 AND SUBPART M	ANY BACKFILLING OF LAND-TREATED SOILS AND SEDIMENTS AND/OR ASH FROM INCINERATION OF TANK CONTENTS CON-STITUTES LANDFILLING OF HAZARDOUS WASTES. LANDFILL MUST BE CONSTRUCTED, OPERATED, CLOSED AND GIVEN POST-CLOSURE CARE IN ACCORDANCE WITH APPLICABLE REQUIRE-MENTS OF 40 CFR 264.1-.178 AND SUBPART M.
ALTERNATIVE #5 IN-SITU VITRIFICATION	ALTERNATIVE #6 CONTAINMENT
BACKFILLING OF ASH FROM IN-CINERATION TANK CONTENTS CONSTITUTES LANDFILLING OF HAZARDOUS WASTES. LANDFILL MUST BE CONSTRICTED, OPERATED, CLOSED AND GIVEN POST-CLOSURE CARE IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF CFR {264.1-.178 AND SUBPART M	PLACEMENT OF CONTAMINATED SOILS AND SEDIMENTS AND ASH FROM IN-CINERATION OF TANK CONTENTS IN CONTAINMENT AREA AND CON-STITUTES LAND-FILLING OF HAZARDOUS WASTES. LANDFILL MUST BE CONSTRICTED, OPERATED,CLOSED AND GIVEN POST-CLOSURE CARE IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF 40 CFR {264.1-.178 AND SUBPART M.
ALTERNATIVE #7 REMOVAL OFF-SITE	ALTERNATIVE #8 RCRA CONTAINMENT
N/A	PLACEMENT OF SAME AS ALTERNATIVE #6
21. VITRIFICATION	
ALTERNATIVE #1 NO ACTION	ALTERNATIVE #2 ON-SITE THERMAL TREATMENT
N/A	N/A

ALTERNATIVE #3 SOIL WASHING EXTRACTION	ALTERNATIVE #4 IN-SITU SOIL FLUSHING/BIORECLAMATION
N/A	N/A
22.ON-SITE TREATMENT OF CONTAMINATED GROUNDWATER SURFACE WATER AND/OR PROCESS WASTEWATERS IN A TANK(S)	
ALTERNATIVE #1 NO ACTION	ALTERNATIVE #2 ON-SITE THERMAL TREATMENT
N/A	UNLESS EXEMPT UNDER 40 CFR {264. AS A "WASTEWATER TREATMENT UNIT", TANK(S) MUST BE CONSTRICTED, OPERATED, CLOSED AND GIVEN POST -CLOSURE CARE IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF 40 CFR {264.1-.178 AND SUBPART J.
ALTERNATIVE #3 SOIL WASHING EXTRACTION	ALTERNATIVE #4 IN-SITU FLUSHING/BIORECLAMATION
SAME AS ALTERNATIVE #2	SAME AS ALTERNATIVE #2
ALTERNATIVE #5 IN-SITU VITRIFICATION	ALTERNATIVE #6 CONTAINMENT
SAME AS ALTERNATIVE #2	SAME AS ALTERNATIVE #2
ALTERNATIVE #7 REMOVAL OFF-SITE	ALTERNATIVE #8 RCRA CONTAINMENT
SAME AS ALTERNATIVE #2	SAME AS ALTERNATIVE #2
23.RECOVERY OF PRODUCT LAYER	
ALTERNATIVE #1 NO ACTION	ALTERNATIVE #2 ON-SITE THERMAL TREATMENT
N/A	N/A

ALTERNATIVE #3 SOIL WASHING/ EXTRACTION	ALTERNATIVE #4 IN-SITU FLUSHING/BIORECLAMATION
N/A	NO ARARS IDENTIFIED
ALTERNATIVE #5 IN-SITU VITRIFICATION	ALTERNATIVE #6 CONTAINMENT
N/A	NO ARARS IDENTIFIED
ALTERNATIVE #7 REMOVAL OFF-SITE	ALTERNATIVE #8 RCRA CONTAINMENT
N/A	N/A

24.UNDERGROUND INJECTION OF FLUIDS

ALTERNATIVE #1 NO ACTION	ALTERNATIVE #2 ON-SITE THERMAL TREATMENT
N/A	N/A
ALTERNATIVE #3 SOIL WASHING/ EXTRACTION	ALTERNATIVE #4 IN-SITU SOIL FLUSHING/BIORECLAMATION
N/A	THE UNDERGROUND INJECTION OF SOIL WASHING FLUIDS MUST MEET APPLICABLE STANDARDS OF 40 CFR PART 144 (CLASS V WELL)
ALTERNATIVE #5 IN-SITU VITRIFICATION	ALTERNATIVE #6 CONTAINMENT
N/A	N/A
ALTERNATIVE #7 REMOVAL OFF-SITE	ALTERNATIVE #8 RCRA CONTAINMENT

25.ACTIVITY WITHIN
A FLOODPLAIN

ALTERNATIVE #1 NO ACTION	ALTERNATIVE #2 ON-SITE THERMAL TREATMENT
EXECUTIVE ORDER 11988, PROTECTION OF FLOODPLAINS 40 CFR PART 6, APP. A. ACTION MUST BE TAKEN TO AVOID ADVERSE EFFECTS, MINIMIZE POTENTIAL HARM, RESTORE AND PRESERVE NATIONAL, AND BENEFICIAL VALUES.	SAME AS ALTERNATIVE #1
ALTERNATIVE #3 SOIL WASHING/ EXTRACTION	ALTERNATIVE #4 IN-SITU SOIL FLUSHING/BIORECLAMATION
SAME AS ALTERNATIVE #1	SAME AS ALTERNATIVE #1
ALTERNATIVE #5 IN-SITU VITRIFICATION	ALTERNATIVE #6 CONTAINMENT
SAME AS ALTERNATIVE #1	SAME AS ALTERNATIVE
ALTERNATIVE #7 REMOVAL OFF-SITE	ALTERNATIVE #8 RCRA CONTAINMENT
SAME AS ALTERNATIVE #1	SAME AS ALTERNATIVE #1

26.ACTIVITY WITHIN A WETLANDS

ALTERNATIVE #1	ALTERNATIVE #2
NO ACTION	ON-SITE THERMAL TREATMENT
EXECUTIVE ORDER 11990,PROTECTION OF WETLANDS, 40 CFR PART 6, APP A. ACTION MUST BE TAKEN TO MINIMIZE THE DESTRICTION, LOSS OR DEGRADATION OF WETLANDS.	SAME AS ALTERNATIVE #1

TABLE 15 EVALUATION OF ALTERNATIVES

ALTERNATIVE	PRESENT WORTH IMPLEMENTATION	PRESENT WORTH O & M
(1) NO ACTION	$114,000	$107,000
(2) ONSITE THERMAL	$38.1M	$44,000
(3) EXTRACTION/ SOIL WASHING	$25.1M	$48,000
(4) IN-SITU FLUSHING BIODEGRADATION	$30.9M	$25,000
(5) IN-SITU VITRIFICATION	$51M	$48,000
(6) CONTAINMENT	$10.5M	$585,000
(7) OFF-SITE DIS -POSAL		
A)INCINERATION	A)$84.7	$53,000
B)LANDFILL	B)$66.9M	$53,000
(8) RCRA LANDFILL	$22.7M	$970,000

TOTAL PRESENT WORTH

(1) $221,000 (2) $38,144,000 (3) $25,148,000

(4) $30,925,000 (5) $51,048,000 (6) $11,085,000

(7) A) $84,753,000 B) $66,953,000 (8) $23,670,000

PROTECTIVE OF HUMAN HEALTH & ENVIRONMENT	COMPLIANCE WITH ARARS	LONG TERM EFFECTIVE -NESS
1)NO	NO	NONE
2)YES-SOILS	YES-ALL	PERMANENT
3)SAME AS ALT.2	SAME AS ALT.2	CONTAMINANTS EXTRACTED/ RESIDUALS DESTROYED
4)SAME AS ALT.2	SAME AS ALT.2	CONTAMINANTS TREATED.
5)SAME AS ALT. 2	SAME AS ALT.2	CONTAMINANTS IMMOBILIZED.
6)YES	NO	CONTAMINANTS CONTAINED NEEDS SIGNI -FICANT MAIN -TENANCE.
7)YES-SOILS, SEDIMENTS EXCEEDING CLEAN-UP LEVELS REMOVED FROM THE SITE	A)YES B)NO	A)CONTAMINANTS DESTROYED B)LAND BAN RESTRICTIONS
8)YES	YES	SIGNIFICANT MAINTENANCE NEEDED

ALTERNATIVE	REDUCTION& MOBILITY,TOXICITY OR VOLUME	SHORT-TERM EFFECTIVENESS
(1)NO ACTION	NONE	NONE
(2)ON-SITE THERMAL	COMPLETE ELIMINA-TION ON-SITE CONTAMINANTS.	SHORT TERM RISKS WILL BE MITIGATED THRU DESIGN AND MONITORING.
(3)EXTRACTION/ SOIL WASHING	CONTAMINANTS ELIM-INATED ON-SITE AND REMOVED FOR OFF -SITE DISPOSAL.	SAME AS ALT.2
(4)IN-SITU FLUSHING BIODEGRADATION	CONTAMINANTS ELIMINATED ON SITE	SAME AS ALT.2
(5)IN-SITU VITRIFICATION	ELIMINATES MOBILITY AND TOXICITY	SAME AS ALT.2
(6)CONTAINMENT	REDUCES MOBILITY	SAME AS ALT.2
(7)OFF-SITE DIS-POSAL A)INCINERATION B)LANDFILL	CONTAMINANTS REMOVED OFF-SITE	SAME AS ALT.2

(8)RCRA LANDFILL	REDUCES MOBILITY	SAME AS ALT.2
IMPLEMENTABILITY	COMMUNITY ACCEPTANCE	STATE ACCEPTANCE
1)READILY IMPLEMENTABLE	NOT ACCEP-TABLE	NOT ACCEP-ABLE
2)READILY IMPLEMENTABLE NEEDS TESTS BURNS.REMEDIATION OVER A FOUR YEAR PERIOD.	NO SIGNIFICANT COMMENTS.	CONCUR SUBJECT TO CONDITIONS STATED IN DECLARATION.
3)NEED TREATABILITY STUDIES.REMEDIATION OVER IN A FOUR PERIOD.	SAME AS 2	DEFERRED UNTIL STATE ACCEPTANCE OF ALTERNATIVE 2
4)TREATABILITY STUDIES NEEDED. REMEDIATION OVER A 10 YEAR PERIOD.	SAME AS 2	SAME AS 3
5)TREATABILITY STUDIES REQUIRED. REMEDIATION OVER A THREE YEAR PERIOD.	SAME AS 2	SAME AS 3
6)MAINTENANCE REQUIRED-LONG TERM	SAME AS 2	SAME AS 3
7)INCINERATOR CAPACITY QUESTIONABLE. LAND BAN RESTRICTIONS MAY APPLY.	SAME AS 2	SAME AS 3
8)LONG TERM MAINTENANCE AND MONITORING REQUIRED.	SAME AS 2	SAME AS 3

#RS

DRAFT RESPONSIVENESS SUMMARY
FOR THE
SOUTHERN MARYLAND WOOD TREATING SITE
ST. MARY'S COUNTY, MARYLAND

FROM MAY 27,1988 THROUGH JUNE 24,1988, THE U.S ENVIRONMENTAL PROTECTION AGENCY (EPA) HELD A PUBLIC COMMENT PERIOD ON THE PROPOSED PLAN ANDTHE REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RI/FS) FOR THE SOUTHERN MARYLAND WOOD TREATING SUPERFUND SITE IN ST. MARY'S COUNTY, MARYLAND. THE RI/FS AND OTHER INFORMATION UTILIZED BY EPA TO SELECT A PREFERRED REMEDIAL ALTERNATIVE IS INCLUDED IN THE ADMINISTRATIVE RECORD WHICH HAS BEEN AVAILABLE TO THE PUBLIC SINCE THE BEGINNING OF THE PUBLIC COMMENT PERIOD. IN ADDITION COPIES OF THE PROPOSED PLAN WERE DISTRIBUTED AT THE PUBLIC MEETING HELD ON JUNE 15,1988 IN HOLLYWOOD,MD. THIS RESPONSIVENESS SUMMARY SUMMARIZES COMMENTS ON THESE DOCUMENTS AS EXPRESSED BY RESIDENTS, LOCAL OFFICIALS AND OTHER INTERESTED PARTIES DURING THE PUBLIC COMMENT AND PROVIDES EPA'S RESPONSES TO THE COMMENTS. PUBLIC COMMENTS WERE SUBMITTED VERBALLY DURING THE PUBLIC MEETING.

SUMMARY OF MAJOR COMMENTS AND EPA RESPONSES

THE PUBLIC MEETING WAS HELD AT THE HOLLYWOOD FIRE HOUSE ON JUNE 15,1988 AT 7:30 P.M. THOSE ATTENDING THE MEETING INCLUDED REPRESENTATIVES FROM EPA, THE MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE),AREA NEWS REPORTERS, AND APPROXIMATELY 12 COMMUNITY RESIDENCE. THE EPA REPRESENTATIVE INCLUDED MR.RAY GERMANN, MR.TONY DAPPOLONE AND MR. VOLTAGGIO. THE MDE REPRESENTATIVE WAS MR. MIKE KILPATRICK. PRIOR TO THE PUBLIC MEETING, EPA AND STATE OFFICIALS ALSO MET WITH ST. MARY'S COUNTY OFFICIALS. DURING THESE MEETINGS, EPA STAFF REPRESENTED AN OVERVIEW OF THE EVENTS THAT HAVE OCCURRED AT THE SITE,DESCRIBED HOW THE SUPERFUND PROGRAM WORKS, DESCRIBED THE PROPOSED REMEDIAL ALTERNATIVES, AND EXPLAINED WHY EPA RECOMMENDS ALTERNATIVE 2(ON-SITE THERMAL TREATMENT) AS THE PREFERRED ALTERNATIVE. THE MDE REPRESENTATIVE DESCRIBED MDE'S PAST EXPERIENCE WITH THE SITE AND THE STATE'S DESIRE TO WORK WITH THE PUBLIC AND EPA IN SELECTING A CLEANUP REMEDY.
FOLLOWING THESE PRESENTATIONS EPA ANSWERED QUESTIONS FROM CITIZENS AND COUNTY OFFICIALS ABOUT THE PROPOSED REMEDY AND CLEANUP OF THE SITE. IN ADDITION CITIZENS WERE GIVEN THE OPPORTUNITY TO ASK QUESTIONS OF THE MARYLAND DEPARTMENT OF THE ENVIRONMENT REPRESENTATIVE.

QUESTIONS AND COMMENTS RECEIVED DURING THESE MEETINGS AND THROUGHOUT THE COMMENT PERIOD ARE SUMMARIZED BELOW AND ARE CATEGORIZED INTO THE FOLLOWING TOPICS: 1) INCINERATION; 2) PREVIOUS STUDIES; 3) HUMAN HEALTH AND SAFETY; 4) NATURE AND EXTENT OF CONTAMINATION; 5) OTHER REMEDIES; 5) OTHER REMEDIES; 6) COST OF CLEANUP; 7) SITE SAMPLING; AND 8) STATUS OF THE LAND AFTER CLEANUP. EACH COMMENT IS FOLLOWED BY EPA'S OR MDE'S RESPONSE. THE QUESTIONS AND RESPONSES SUMMARIZED HERE ARE ALSO CONTAINED IN THE OFFICIAL TRANSCRIPT OF THE MEETING. COPIES OF THE TRANSCRIPT ARE AVAILABLE AT THE ST.MARY'S COUNTY MEMORIAL LIBRARY AND HEALTH DEPARTMENT IN LEONARDTOWN,MD.

INCINERATION

QUESTION: A COUNTY OFFICIAL AT THE EPA/COUNTY MEETING AND LATER, AT THE PUBLIC MEETING, A LOCAL RESIDENT, MR ROBERT LARRABEE, ASKED WHAT WOULD BE THE CHEMICAL COMPOSITION OF THE ASH RESULTING FROM INCINERATION OF THE HAZARDOUS WASTE.

RESPONSE: EPA WILL CONDUCT A TEST BURN TO ANALYZE THE CHEMICAL CONTENT OF THE ASH. BEFORE THE TECHNOLOGY IS IMPLEMENTED AT THE SITE, THE TEST RESULTS MUST INDICATE THAT THE ASH IS NON-HAZARDOUS. STUDIES OF INCINERATION HAVE SHOWN THAT THIS PROCESS RENDERS HAZARDOUS MATERIAL NON-HAZARDOUS.

QUESTION: MR. LARRABEE ASKED IF INCINERATION WOULD: 1) VOLATIZE THE CONTAMINANTS AND CAUSE AN AIR QUALITY PROBLEM; 2) IF THE AIR EMISSION

WOULD BE WASHED AND 3) IF THE EMISSIONS WOULD REACH NEIGHBORING HOMES.

RESPONSE: REMEDIES FOR CLEANUP OF SUPERFUND SITES MUST MEET ALL FEDERAL ,STATE, AND LOCAL ENVIRONMENTAL STANDARDS; THIS INCLUDES AIR QUALITY STANDARDS. IF THE EMISSIONS DO NOT MEET AIR QUALITY STANDARDS, THEY WILL BE CLEANED. WHETHER OR NOT THE EMISSIONS ARE WASHED DEPENDS UPON THE TYPE OF INCINERATOR ACTUALLY USED AT THE SITE.

QUESTION: A COUNTY OFFICIAL ASKED IF THERE WOULD BE ANY OFF-SITE IMPACTS.

RESPONSE: IF ALTERNATIVE 2 IS SELECTED, THE OFF-SITE IMPACTS WILL BE SHORT-TERM AND COULD INCLUDE AN INCREASE IN TRUCK TRAFFIC ON AND OFF THE SITE,INCREASED NOISE LEVELS, AND DUST EMISSIONS THAT MAY BE PERCEIVED AS AN AIR POLLUTION PROBLEM. THE CLEANUP WORK ON THE SITE MUST COMPLY WITH STATE SOIL EROSION CONTROL LAWS AND NOISE STANDARDS.

IF AN OFF-SITE REMEDY IS SELECTED, THE OFF-SITE IMPACTS WILL BE GREATER AND VARY WITH THE OPTION.

QUESTION: A COUNTY COMMISSIONER ASKED IF THE INCINERATOR COULD BE USED AFTER THE CLEANUP FOR WASTE INCINERATION.

QUESTION: MR LARRABEE ASKED IF DIOXINS HAVE BEEN TREATED BY INCINERATION.

RESPONSE: MR KILPATRICK RESPONDED THAT INCINERATION HAS BEEN USED SUCESSFULLY AT A MISSOURI SUPERFUND SITE TO DISPOSE OF THE MOST TOXIC FORM OF DIOXINS. HE ADDED THAT THE SOUTHERN MARYLAND WOOD TREATING SITE ARE OF A LESS TOXIC NATURE.

QUESTION: MR COMBS INQUIRED AS TO WHY EPA HAS NOT SHIPPED SAMPLES FROM THE SITE TO THE INCINERATOR FOR TESTING.

RESPONSE: THE MATERIALS WILL BE TESTED BEFORE AN INCINERATION REMEDY IS FULLY IMPLEMENTED AT THE SITE.

QUESTION: MR COMBS ASKED IF ANYONE ATTENDING THE MEETING HAD SEEN AN INCINERATOR.

RESPONSE: MR THOMAS VOLTAGGIO OF EPA RESPONDED THAT HE HAS SEEN INCINERATORS IN OPERATION. HE DESCRIBED THE PROCESS AT A FACILITY AND SAID THE PROCESS IS TIGHTLY CONTROLLED AND MONITORED.

HE ADDED THAT INCINERATION DESTROYS 99.99% OF THE HAZARDOUS SUBSTANCE FROM THE MATERIAL BEING CLEANED. WHEN DEALING WITH DIOXINS THE MATERIAL MUST BE CLEANED TO 99.99%. IF THE TECHNOLOGY AT THE SITE CANNOT ACHIEVE THIS LEVEL, THEN IT WILL NOT BE USED.

PREVIOUS STUDIES

QUESTION: MR. COMBS ASKED WHAT BACKGROUND INFORMATION EPA USED TO PREPARE THE FEASIBILITY STUDY AND RESULTING RECOMMENDATIONS.

RESPONSE: THERE WERE THREE PHASES TO EPA'S WORK. FIRST THE CONTAMINANTS WERE IDENTIFIED, THEN THE SITE CONTAMINANTS WERE CHARACTERIZED AND FINALLY THE LOCATION OF THE CONTAMINATION WAS ESTABLISHED.

THIRTY TECHNOLOGIES WERE SCREENED FOR USE AT THE SITE. MANY WERE DISCARDED BECAUSE OF IMPRACTICALITY OR BECAUSE THEY WERE TOO EXPERIMENTAL. THE EIGHT ALTERNATIVES PRESENTED IN THE PROPOSED PLAN HAVE ALL BEEN USED IN RESEARCH OR AT ACTUAL SITE LOCATIONS. BECAUSE EACH SITE DIFFERS, IT IS UNCLEAR IF A SELECTED REMEDY WILL WORK AT A PARTICULAR SITE UNTIL IT IS TESTED FOR THAT SITE.

QUESTION: MR. COMBS ASKED WHY EPA DID NOT INCINERATE THE HAZARDOUS MATERIALS, ESPECIALLY THE DIOXINS, DURING IT'S PAST ACTIVITIES AT THE SITE.

RESPONSE: PAST WORK AT THE SITE WAS SOLELY FOR CONTROLLING THE SPREAD

OF CONTAMINATION FROM THE SITE AND NOT TO CLEAN UP THE SITE. THE PRESENT EFFORTS ARE AIMED AT CLEANING UP THE SITE.

HUMAN HEALTH AND SAFETY

QUESTION: A COUNTY OFFICIAL ASKED WHAT WERE THE HAZARDS TO WORKERS FROM THE ORIGINAL WORK DONE AT THE SITE.

RESPONSE: ALTHOUGH THE EPA STAFF ATTENDING THE MEETING DID NOT KNOW, THEY COULD GET AN OPINION FROM THE AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY OF THE NATIONAL CENTERS FOR DISEASE CONTROL. NORMALLY. THE TYPE OF CONTAMINANTS AT THIS SITE ARE CHRONIC IN NATURE AND WOULD POSE A HEALTH RISK ONLY IF THE WORKERS WERE EXPOSED OVER A LONG PERIOD OF TIME.

A COUNTY OFFICIAL NOTED THAT THE COUNTY HAD ARRANGED FOR SITE WORKERS TO BE SCREENED AT A LOCAL FACILITY BUT ONLY TWO WORKERS CHOSE TO BEAR THE EXPENSE. THERE WERE NO FINDINGS AND NO SUBSEQUENT FOLLOW-UP WITH THOSE WORKERS.

QUESTION: A COUNTY OFFICIAL ASKED IF THE MATERIALS IN THE WEST TRIBUTARY ARE IMMEDIATELY HAZARDOUS TO HUMAN HEALTH.

RESPONSE: THE CONTAMINANTS INCLUDE CREOSOTE, PENTACHLOROPHENOL, AND DIOXINS. ALTHOUGH THESE CONTAMINANTS ARE TOXIC TO HUMANS, THEY ARE IN IN THE STREAMBED SEDIMENTS OF THE WEST TRIBUTARY AND ARE MOSTLY TOXIC TO AQUATIC LIFE. THEY WOULD POSE A PROBLEM TO HUMAN HEALTH IF AN INDIVIDUAL WERE TO HAVE DIRECT CONTACT WITH THE STREAMBED SEDIMENTS.

QUESTION: MR PETER GAMBLE, AN AREA RESIDENT, ASKED WHY SOMEONE STILL WORKS AT THE SITE WHEN IT IS CONTAMINATED.

RESPONSE: THE INDIVIDUAL IS NOT WORKING IN A HIGHLY CONTAMINATED PART OF THE SITE. THE EPA DOES NOT REGULATE WORKER SAFETY AND DOES NOT OWN THE PROPERTY.

NATURE AND EXTENT OF CONTAMINATION

QUESTION: HOW FAR DOWNSTREAM OF THE WEST TRIBUTARY HAS THE CONTAMINATION REACHED?

RESPONSE: CONTAMINANTS HAVE MIGRATED 1900 FEET DOWN THE WEST TRIBUTARY. THE MIGRATION OF CONTAMINATION HAS SLOWED BECAUSE THE REMOVAL ACTION REMOVED THE CONCENTRATED SOURCE OF CONTAMINATION.

QUESTION: HOW MANY YEARS WOULD IT TAKE FOR THE CONTAMINANTS TO BREAK DOWN NATURALLY?

RESPONSE: THE CONTAMINANTS ARE PERSISTENT IN THE ENVIRONMENT AND DO NOT DECOMPOSE READILY WHEN IN HIGH CONCENTRATIONS.

OTHER REMEDIES

QUESTION: HAS THE STATE USED BIODEGRADATION BEFORE AT THE SITE?

RESPONSE: BIODEGRADATION WAS ATTEMPTED AT THE SITE, ALTHOUGH NOT BY THE STATE, BUT THIS METHOD WAS UNSUCCESSFUL. THIS PROCESS REQUIRED CAREFUL MAINTENANCE AND WAS MORE OF A CHEMICAL PROCESS THAN A SIMPLE SOLUTION INVOLVING EARTH TILLING.

QUESTION: MR. COMBS SUGGESTED BUILDING A CONCRETE VAULT TO STORE THE CONTAMINATED MATERIALS AT THE SITE.

RESPONSE: ALTERNATIVE 8 IN THE PROPOSED PLAN DOES SUGGEST ON-SITE CONTAINMENT.

COST OF CLEANUP

QUESTION: A COUNTY OFFICIAL ASKED HOW MUCH THE INCINERATOR WILL COST AND WHO IS GOING TO PAY.
RESPONSE: THE COST ESTIMATES FOR THE ALTERNATIVES IN THE PROPOSED PLAN INCLUDE THE COST FOR THE EQUIPMENT AND TREATMENT. MUCH OF THE TREATMENT COST FOR ALTERNATIVE 2 IS IN THE EXCAVATION OF THE SOILS BECAUSE EXCAVATION INVOLVES MOVING LARGE VOLUMES OF HAZARDOUS WASTE CONTAMINATED MEDIA. THE COST OF THE EQUIPMENT WILL VARY DEPENDING ON THE VENDOR HIRED AND THE INCINERATOR SELECTED.

THE FEDERAL SUPERFUND PROGRAM WILL COVER 90 PERCENT OF THE COST AND THE STATE WILL COVER 10 PERCENT OF THE COST. FUNDING IS AVAILABLE TO IMPLEMENT THE CLEANUP AS SOON AS A REMEDY IS SELECTED.

SITE SAMPLING

QUESTION: MS. JOY BUDDENBOHN, AN AREA RESIDENT, ASKED WHEN THE LAST SAMPLING WAS DONE AT THE SITE AND HOW FAR DOWNSTREAM SAMPLES WERE COLLECTED FROM THE WEST TRIBUTARY.

RESPONSE: SAMPLING WAS LAST CONDUCTED BETWEEN 18 TO 24 MONTHS AGO. THE SAMPLES WERE TAKEN FROM THE STREAM AND STREAMBED SEDIMENTS AS FAR AS 7000 FEET DOWNSTREAM. THE DATA INDICATE THAT THE CONTAMINATION IS NOT MOVING VERY QUICKLY.

STATUS OF LAND AFTER CLEANUP

QUESTION: A COUNTY OFFICIAL ASKED WHAT THE LANDS STATUS WOULD BE ONCE THE FOUR YEAR CLEANUP PERIOD IS OVER.

RESPONSE: FUTURE USE OF THE SITE DEPENDS UPON THE CLEANUP ALTERNATIVE SELECTED. IF ALTERNATIVE 2 IS SELECTED, THERE WILL BE LITTLE CONSIDERATION, IF ANY, ON FUTURE LAND USE.

IN ADDITION, THE FEDERAL GOVERNMENT WILL SUE TO RECOVER THE COST OF THE CLEANUP, AND THIS MAY AFFECT FUTURE OWNERSHIP OF THE LAND.